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**EVALUATION OF THE CHARACTERISTICS OF URBAN  
LANDSCAPE DEVELOPMENT IN AREQUIPA FROM 1868  
TO 1940**

**Carlos Renzo Zeballos Velarde**

**Dissertation submitted as a partial requirement for the Degree of Doctor of  
Philosophy Urban Landscape Planning.**

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**DEDICADO A MIS PADRES CARLOS Y MARLENE, POR SU APOYO Y  
EJEMPLO Y POR SU CORAJE Y UNIÓN EN MOMENTOS DIFÍCILES.**

**TO JANETTE SIMPLINA, FOR HER EVERYDAY SUPPORT AND  
INSPIRATION.**

**AGRADEZCO A LAS PERSONAS E INSTITUCIONES QUE ME BRINDARON SU  
APOYO EN AREQUIPA COMO EN KIOTO.**

**MY DEEP GRATITUDE TO ALL THE PEOPLE WHO GAVE ME THEIR  
SUPPORT IN AREQUIPA AND KYOTO.**

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## **CHAPTER 1**

### **INTRODUCTION**



## 1.1 SUBJECT OF STUDY

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Arequipa is a unique city in Peru and in the Americas because of the character of its urban layout, public spaces and streets, the architectural quality and beauty of its monuments, the singular use of materials and the interesting mixture of styles, combining European influences with local labor.

At the same time, the relationship of the city with its environment is also an important and particular factor. The city is located next to the Chili River, amid the desert and the Andes Mountains in the Southern Peru, 100 km away from the Pacific Ocean. Throughout its history the inhabitants of the city had carried out a remarkable transformation of the deserted Chili Valley into an “artificial oasis”<sup>1</sup>. This process was begun about 10 centuries ago by several Pre Hispanic cultures, who modeled the landscape with gracious terraces and colorful agricultural fields, arranged throughout the hilly and irregular topography. The presence of the majestic snow-covered volcanoes defined an impressive background that dominates the territory.

Due to these particular characteristics, the central urban core of Arequipa has been declared World Heritage Site by UNESCO because “*the ornamented architecture in the historic centre of Arequipa represents a masterpiece of the creative integration of European and native characteristics, crucial for the cultural expression of the entire region*” and because it is an “*outstanding example of a colonial settlement, challenged by the natural conditions, the indigenous influences, the process of conquest and evangelization, as well as the spectacular nature of its setting*” (UNESCO, 2000)<sup>2</sup>

However, beyond the universally renowned heritage produced during colonial and republican (XVI to mid XIX centuries), this research proposes that the city’s unique urban values include also the urban development between 1868 to 1940, an époque in which the urban planning took into account landscape premises and favored an important approach to the riverscape. This period started with the reconstruction of the city after the devastating 1868 earthquake and lasted until the development that was carried out by the municipality to celebrate its 4<sup>th</sup> centennial in 1940. During this time, the city underwent modernization with important influences from Europe, but taking into consideration the local landscape and natural resources. The citizens adapted the new technologies, materials and ideals to its own environment, conditioned by a particular climate and a very active seismic activity.

Within the city, the area around the Chili River has been selected due to the richness of the riverscape, the role of the river in the collective consciousness of the population and because it is a zone that contains a representative typological variety of the streets and public spaces, some of them visually and spatially linked to the riverfront.

## 1.2 OBJECTIVE

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The motivation for carrying out this research had two complementary approaches. On the first hand, I was interested to introduce a case in Latin America as a successful experience of riverfront management, where the urban modernity coexisted with the idea of closeness to nature. At the same time, I aimed to provide a different approach on the history of the urban development of Arequipa, from the perspective of landscape urban planning.

During the evolution of the city and its public spaces, the development of individual catalytic elements has stimulated favorably the transformation of other urban components and eventually of the city and its urban life. In Arequipa, a city with historical heritage and valuable landscape resources, the strategic introduction of catalytic elements revitalized urban areas without transforming them dramatically. After the 1868 earthquake, the transformation of the Main Square into a space for contemplation, favored the creation of a system of public spaces, the application of medium-scale urban plans and the use of local experience and popular knowledge to spatially link the city's most important landscape resource: the Chili River. This process respected the original and historic urban layout and connected the spaces by a virtual network of visual elements that the observer experienced and discovered while walking along them.

Similarly, the process of evolution of Arequipa streetscape during the period of 1870 to 1940 clearly showed an effort to incorporate landscape features into the city's urban planning. The streets define the structure of a city as "channels along which the observer moves" (Lynch, 1960, 47)<sup>3</sup>, but they are also public spaces whose configuration and aesthetics define the image of the city and its relation to the environment. The evolution of the streets in Arequipa is related not only to functional issues such as the movement of the population, but it has been influenced by social, cultural, technological and aesthetic factors. The spatial configuration of the streets, their section and width/height ratio, materials, urban furniture and the composition of their contiguous architectural elements defined several street typologies, establishing the character of the image of the city and influencing the perception of the surrounding landscape.

The interaction of these two urban elements, public spaces and streetscape, and their relation to the river throughout time are the main components of this study. Therefore, the aims of this research are the following:

- To identify the location and characteristics of the interface city-river.
- To analyze the elements that form the spatial structure of the city and whose co-existence characterize the unique image of Arequipa.
- To clarify the process of evolution of the public spaces and the streetscape in the proximities of the river, focusing in the period from 1870 to 1940.

### 1.3 LITERATURE REVIEW

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The majority of studies on urbanism at the end of XIX century and the beginning of XX century are focused on cases in Europe and the United States, but very few take into account the processes occurred in Latin America, despite its rich urban heritage. However, there are some interesting studies such as the work of Spiro Kostoff (1999)<sup>4</sup> and his important comparative study on the urban spaces in different cities in the world, as well as the experience of Christopher Alexander in Lima, Peru (1977)<sup>5</sup>, for his analysis of the urban patterns.

In order to nourish our knowledge on the perception of the city, we have reviewed the works of Lynch (1953<sup>6</sup> and 1960<sup>7</sup>), Passini (1984)<sup>8</sup> and Gordon Cullen (1971<sup>9</sup>), in order to understand the concepts of imageability and legibility in a city and to comprehend what gives visual coherence and organization to the buildings, streets and spaces that make up the urban environment.

On the other hand, regarding the impact that some designs can have in the image of the city, Attoe and Logan (op.cit. 1989) proposed the concept of urban catalysis analyzing several cases in the USA, although their work does not include necessarily a landscape approach. However, Higuchi (1983, pp 190-193)<sup>10</sup> has stressed the importance of landscape in Japanese tradition and urban development

In a local level, historians like Galdos (1990<sup>11</sup>) had researched about the pre Hispanic and Hispanic period in Arequipa. We also have reviewed the work of Bielza de Ory (2002<sup>12</sup>) to compare the case of Arequipa with other cases in the American Spanish Colonies. Moreover, the Carpio's newspapers compilation of events in Arequipa from 1867 to 1911 (1983)<sup>13</sup> and the Gutierrez's study of the urban evolution of Arequipa from 1540 to 1990 (1992)<sup>14</sup> are useful to understand the historical and social economic context in which the streetscape had evolved.

Documents such as the old Memoirs of the municipal administrations have been reviewed in the Municipal Library of Arequipa, as well as old newspapers like *La Bolsa* and *El Pueblo*.

Old pictures related to the area of study have been collected from compilations in "Arequipa fue Así" (Gloria, 2000), "Arequipa en blanco y negro" (Mitchell, 1996), "Arequipa la Única" (Zeballos, 1973), "Fotos de los Hermanos Vargas" (Egasa, 2005), "La Arequipa de 1883" (Gloria, 1989), "Arequipa, Su Pasado Presente y Futuro", (Pardo, 1963) and "Arequipa, Ciudad y Contornos" (Zeballos, 1976). All these books have been edited and Published in Arequipa.

An interesting lithography from 1865 of the riverscape in Arequipa, included in the Maniano Felipe Paz Soldan's atlas published in Paris which belong to the David Rumsey's map collection, can be found in internet at this site: <http://www.davidrumsey.com/maps2763.html>. This picture was very useful to understand the situation of the streetscape prior to the modernization.

The old maps of Arequipa analyzed have been provided by the Technical Office of the Historical Center of Arequipa OTCHA, from the Superintendencia de Administracion y Control del Centro Historico de Arequipa. The maps correspond to the years 1609, 1773, 1784, 1797, 1800, 1840, 1856, 1905, 1917, 1925, 1940 and a copy of them will be provided in the Appendix.

Last but not least, personal interviews have been conducted to renown scholars, such as Architect William Palomino, (2004), Architect Luis Maldonado (2004), Architect Luis Samanez (2004), Historian Juan Guillermo Carpio Muñoz, PhD (2005), Architect Carlos Maldonado (2005), Historian Eusebio Quiroz Paz Soldan, PhD (2005), Professor Carlos Zeballos Barrios, PhD (2005), Professor Celedonio López (2006), as well as interviews to senior local inhabitants.

## 1.4 METHODOLOGY

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In this dissertation, the conducted investigation was consisted of several stages wherein different methods have been applied.

Like most researches, our first stage was focused on gathering data as a tool for gaining a better understanding on the city and its historical relationship with the environment. We have collected and compiled the available data related to the urban history of Arequipa such as documents, photographs, maps and testimonials from the local renowned scholars. We developed a relational database in order to organize, sort and group the information from documentary sources. The maps were converted to digital formats to standardize the geographical units in order to facilitate a systematic comparison of the development of the city through time. The data collected led us to identify and select the main study area: the area around the Chili River. It has been selected due to the richness of the riverscape, its special urban characteristics and because it is a zone that contains a representative typological variety of public spaces and streets.

The second stage was dedicated to the understanding of the city's urban structure evolution, along with the events and factors involved in that process. At this stage, GIS was used as a tool to analyze the various urban patterns by superimposing the collected maps from different periods. This analysis led us to identify a breakpoint in the city's development, wherein landscape issues were given a high priority to be included in the urban planning. That period started with the reconstruction of the city after the 1868 destructive earthquake until the construction of urban development planned in commemoration of Arequipa 4th Centennial in 1940.

In the third stage we identified the main components in the urban structure (open spaces, plazas or parks, and the streets), and we focused on their physical and spatial evolution. The analysis was based on the written documents and old photos. In addition to this data, photographic field survey and measurements were conducted as supplement in the creation of 3D models reconstructing different scenarios of those spaces during the period covered in this research.

For the final stage, the strong connection between the city and riverscape was established and a model of a model of spatial system was proposed. For doing so, the following were considered; a.) The street typologies were identified as well as the role of the landscape design in shaping the structure of the streetscape; b.) The main square was analyzed regarding its functionality and form, and how it influenced other surrounding public spaces; c.) The Chili River was identified as a main landscape resource and ecological axis to the development of the city's structure. The analysis of these three aspects was assisted by the estimation of the people's perception of the urban visual form at that time by using indirect sources such as old maps, drawings, photographs, poems and actual interviews to local researchers.

	<b>STAGE I</b>	<b>STAGE II</b>	<b>STAGE III</b>	<b>STAGE IV</b>
<b>PROCEDURE</b>	1. Compilation of data 2. Selection of study area	3. Understanding of Urban Evolution process 4. Identification of breakpoint in the process.	5. Identification of main components in the urban structure. 6. Analysis of evolution of urban spaces.	7. Analysis of the relationship between spaces. 8. Model of Urban Spatial System
<b>QUESTION</b>	<b>Where</b> the main interface of the city and landscape is located?	<b>Why</b> the city changed? <b>Where</b> the main changes occurred?	<b>What</b> had changed? <b>How</b> it had changed?	<b>How</b> these urban components related together?
<b>TOOL</b>	<ul style="list-style-type: none"> <li>▪ Relational Databases</li> <li>▪ Digitalization of old maps</li> </ul>	<ul style="list-style-type: none"> <li>▪ GIS Georeferenced expansion and growth areas maps</li> </ul>	<ul style="list-style-type: none"> <li>▪ : Reconstruction of the main spaces, and their spatio/ temporal evolution</li> </ul>	<ul style="list-style-type: none"> <li>▪ Perceptual maps</li> <li>▪ GIS Geographical analysis of lands use</li> </ul>
<b>SOFTWARE</b>	<ul style="list-style-type: none"> <li>▪ Microsoft Access 2002</li> <li>▪ Adobe Photoshop 6</li> <li>▪ Google Earth</li> <li>▪ AutoDesk AutoCAD 2004</li> </ul>	<ul style="list-style-type: none"> <li>▪ Arc GIS 9.0</li> </ul>	<ul style="list-style-type: none"> <li>▪ Photographic measurement field survey</li> <li>▪ AutoDesk AutoCAD 2004</li> <li>▪ 3DS Max 8</li> </ul>	<ul style="list-style-type: none"> <li>▪ Arc GIS 9.0</li> </ul>



## 1.5 STRUCTURE

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The main topics presented in this study are presented in the following.

Chapter 1, presents the subject of study, and explains the aims, motivations, the methodology and structure of the thesis.

Chapter 2 will show an introduction to the case of study, since the natural features in Arequipa might not be familiar for a reader in Japan. It also describes the morphology of the Chili River basin and its contact with the city and the environmental aspects that had influenced the urban architectural uniqueness of the city

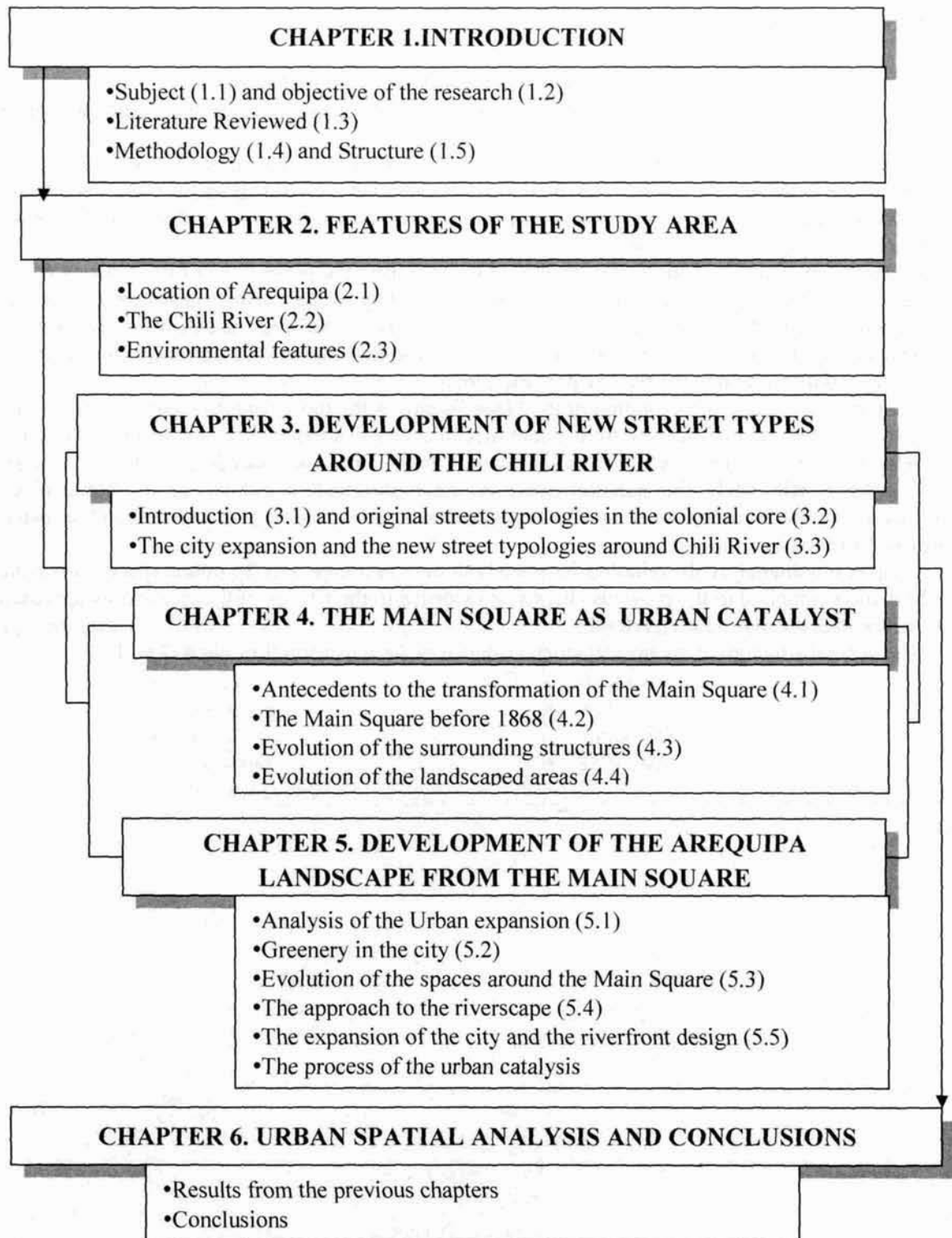
Chapter 3 explains the historical evolution of the city from the perspective of the analysis of the streetscape and its physical spatial configuration. According to their spatial characteristics, street types will be identified and categorized, first analyzing the central core and then focusing on the expansion during the period of 1870 to 1940. Also, the development of landscape in the urban planning and its relation to the river will be explained

Chapter 4 will study the evolution of the Main Square as the most important public space in the city, the transformation of its role from a commercial center to a place for public recreation and the development of new styles applied in its surrounding architecture and its landscaped areas.

Chapter 5 will study the transformation of other surrounding public spaces that evolved influenced by the Main Square and will categorize those spaces according to their role in the spatial structure of the city.

Chapter 6 will analyze the relations between both the streetscape and the public spaces, using the information compiled in the previous chapter as evidence to the change of the city and its approach to nature, specifically to the riverfront.

The general structure of the present study is shown in the following flow chart (Fig. 1.1)



**Fig. 1.1.** General structure of the research

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## **CHAPTER 2**

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### **FEATURES OF THE STUDY AREA**

**“In Arequipa, eternal spring...”**

**Miguel de Cervantes Saavedra (1547-1616)  
in *La Galatea* (Madrid, 1585)**

## 2.1 PHYSICAL FEATURES

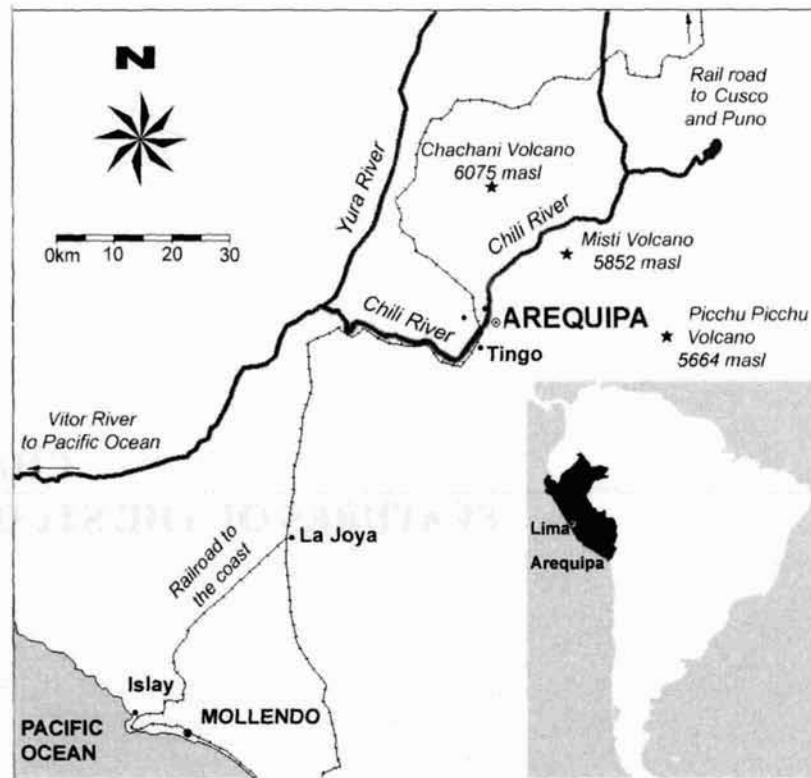


Fig 2.1. Location of Arequipa in Peru and South America (Made by the author based on maps by Microsoft Encarta 2002)

### (1) LOCATION OF AREQUIPA

Arequipa is located in the central occidental region of the South American continent, at an altitude of 2330 m amid the Andes mountain chain and the desert in the Southern Peru<sup>1</sup>. It is located 84 km from the Pacific Ocean and 768 km southeast from Lima, the capital of Peru.

The coordinates of its urban center are 16°23'55.96"S 71°31'12.81"W and it is located 772 km South from the capital of Peru, Lima. (Fig. 2.1).

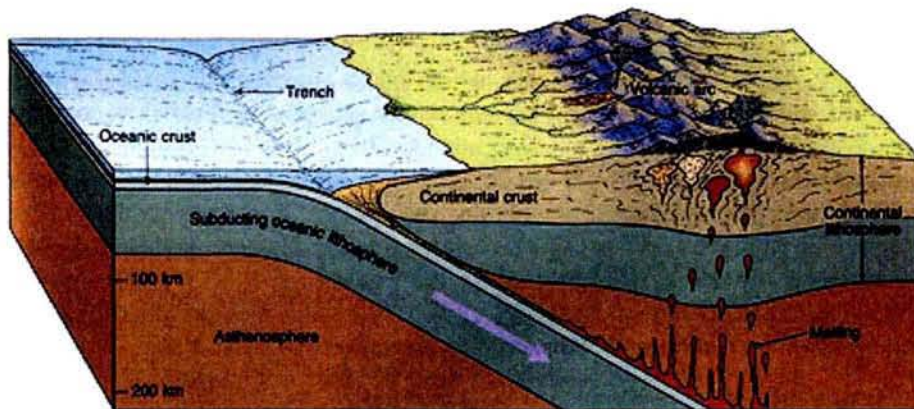


Fig 2.2. Comparative altitude of Arequipa and other nearby cities (Source, Carlos Zeballos B, 1981)



## (2) GEOMORPHOLOGY

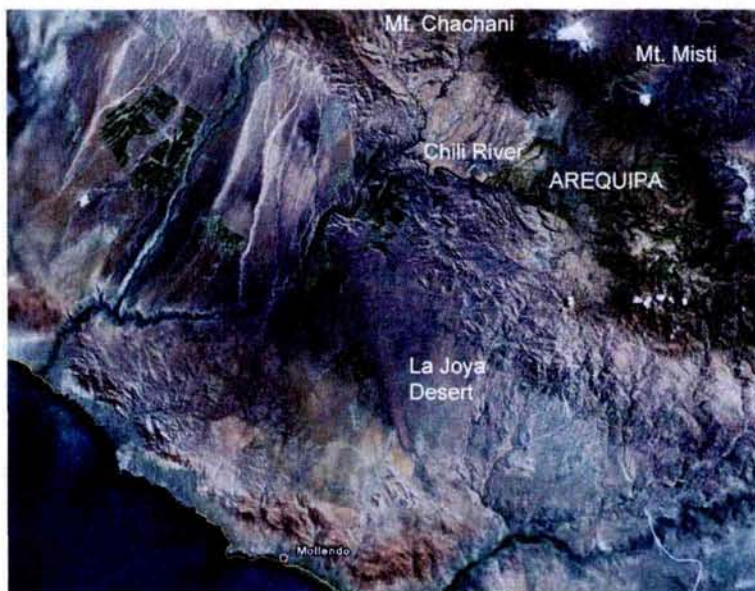
The region is affected by the Nazca Trench, a zone of convergence between the Nazca Ocean Plate and South American Continental Plate, which presents subduction activities. (**Fig. 2.3**). Therefore, the configuration of the terrain in Arequipa is the consequence of geologic and volcanic processes, as well as of the erosion of the Chili River (**Fig. 2.4**). As a result, earthquakes have been frequent and important part in the life, construction and reconstruction of the city



**Fig 2.3.** Schematic view of the Nazca Trench. (Source: Tsunami warning issued for the Pacific. <http://www.gly.fsu.edu/~odom/1000/tectonics/oc-co.gif>)

Arequipa is located in the Chili Valley, sited on a 1.5% slope running from North to Southwest, but in the proximities of the river the relief becomes steeper, reaching 30% slope (Pegup, 2000).

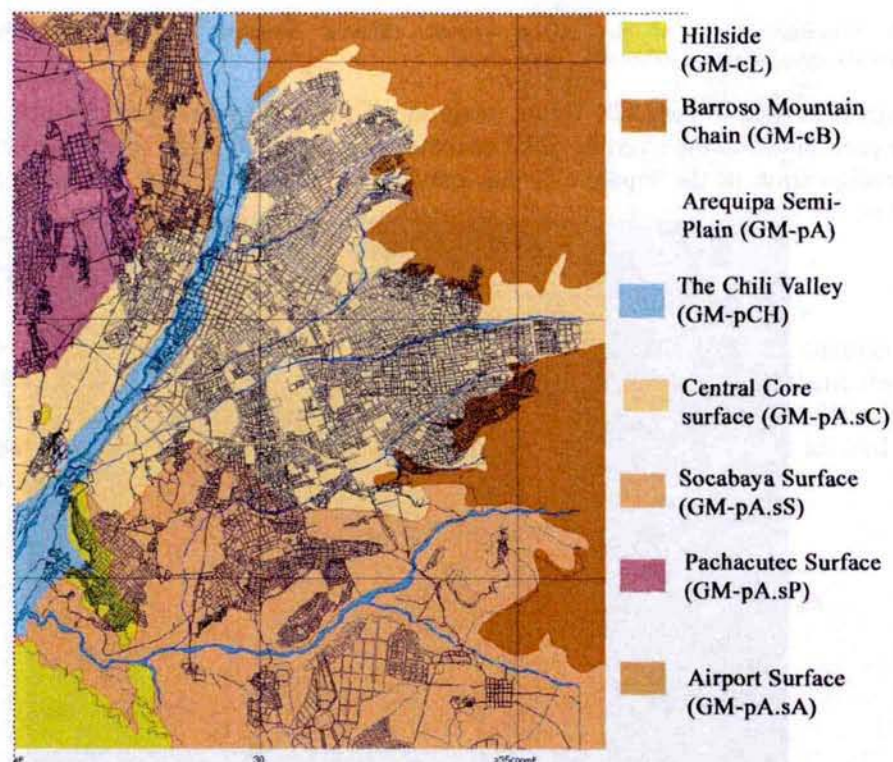
The configuration of the topography has conditioned the layout and development of the city.



**Fig 2.4.** Location of the Chili Valley amid the desert (Satellite image taken from Google Earth 3)

Arequipa is settled over an uneven topography, in which the following geomorphology can be distinguished (**Fig. 2.5**) (PEGUP, op cit, 15):

- **Mountain hillside (GM-cL)** the surface of the terrain is rocky. Big blocks of several meters can be observed in the proximities of the river.
- **Barroso Mountain Chain (GM-cB)** characterized for a slope surface, crossed by several ravines of steep walls. In some cases, the erosion caused by the torrents during the rainy season can cause small canyons.
- **Arequipa Semi-Plain (GM-pA)** Inside this unit, the following sub units can be distinguished
  - **The Chili Valley (GM-pCH)**, which includes three terraces at different levels, including the actual terrace where the river flows.
  - **Central Core surface (GM-pA.sC)**, which has a slope of 5% to 6% towards the South West and it is crossed by several ravines where seasonal torrents flow, such as the one in San Lazaro.
  - **Socabaya Surface (GM-pA.sS)** which extends towards the South West of the Main Square and it is characterized by a smooth texture and a almost horizontal tendency
  - **Pachacutec Surface (GM-pA.sP)** It is mostly plain, characterized by the presence of low depressions
  - **Airport Surface (GM-pA.sA)**, which runs to the North West of the city, characterized by the presence of several moderately deep ravines.



**Fig 2.5.** Geomorphologic map of Arequipa Source: Atlas ambiental de Arequipa, 2000



### (3) NATURAL FEATURES OF THE LANDSCAPE

The most important features in the landscape in Arequipa are the volcanic chain, the farms in the valley and the Chili River.

The landscape is dominated by the presence of three majestic volcanoes from Northwest to East: Chachani Volcano (altitude 6075 m), Misti Volcano (5825 m) y Pichu Pichu Volcano (5664 m). Minor hills surround Arequipa from the South and West, separating the valley from the La Joya Desert. The city actually stands at the foot of the Misti volcano, which has become the most representative symbol of the city and reference in the memory of the population, because of its conic shape.

The agricultural area of the periphery of the city is embodied in beautiful picturesque landscapes, in which numerous towns are located. Many authors have praised the beauty of Arequipa's landscape. Carlos Zeballos Barrios emphasizes the pleasure of contemplate the "intense and pure green fields contrasting with the extreme aridity or the surrounding desert". The rich chromatism of the landscape is complemented with "hills of diverse tones of violet that surround the city, and most especially, the enormous masses of the snow-covered volcanoes" (op cit, 66).

The agricultural fields form a big chessboard in different degrees of green and with the Incan system of sowing in terraces or "*andenerías*" (**Fig. 2.6**). The countryside of Arequipa has been an inexhaustible source of inspiration for artists and poets.

The Chili River will be explained in more detail in the section 2.3 in this chapter.



**Fig 2.6.** View of the Chili Valley and majestic Chachani volcano (Photo taken by the author)

### (4) SYNOPSIS

The geographical conditions of Arequipa, located in a valley between the coast and the highlands, the fertile valley despite the desert surroundings and the impressive landscape are factors that have conditioned the development of the city. At the same time, the intense seismic activity has determined the use of unique constructive techniques, combining local materials with the architectural models brought by the Spaniards.

## 2.2 ENVIRONMENTAL REFERENCES

The climate in the city of Arequipa has influenced its architecture and therefore the character of its streetscape and public spaces. It corresponds to the “Continental Climate model” and therefore it is semi-desert with scarcity of rainfall. These phenomena create conditions of atmospheric dryness.

### (1) TEMPERATURE

The average relative humidity is less than 40%, except in the rainy season, which is only during the summer (January to March). During these months, naturally the weather is cloudier, but the rest of the year the sky is mostly clear. Because of these factors, the temperature has a strong variation during the day, ranging from 10 to 25 degrees centigrade (Fig 2.7), it is mild during the daytime, but after the sun sets it falls quickly until it becomes lower than the levels of comfort (Fig 2.8) (Almodóvar, 2006, 118)<sup>2</sup>. However, the temperatures are stable during the different seasons in the year. In fact, the annual fluctuation of the monthly averages is sometimes less the 2 degrees centigrade (Fig 2.7).

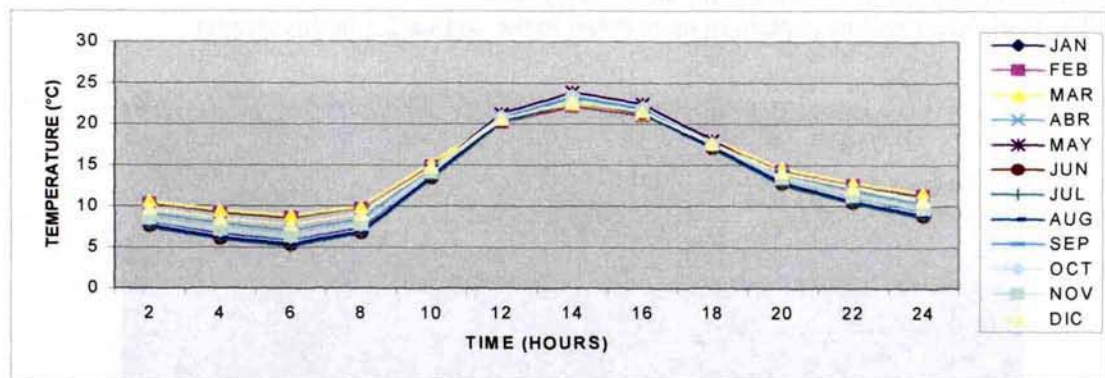


Fig 2.7. Chart of temperature in Arequipa. Source SENAMHI Arequipa

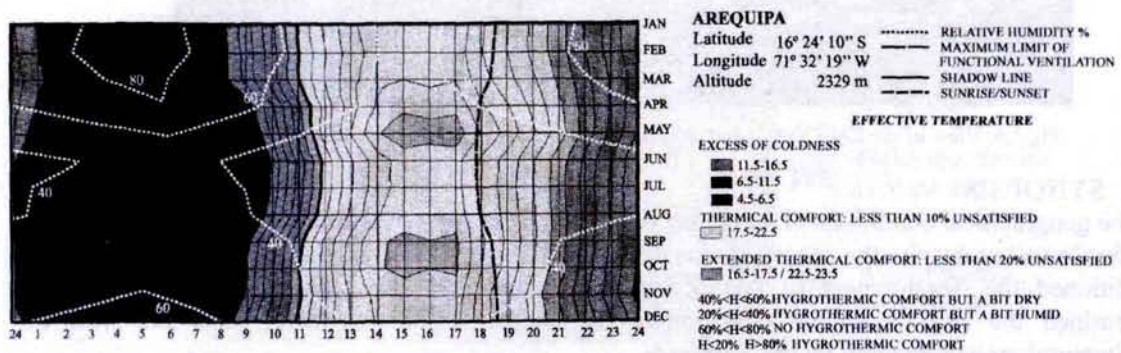


Fig 2.8. Comfort Chart of Arequipa, after Almodovar, 2006

## (2) SOLAR INCIDENCE

Due to its high altitude, low latitude and arid climate the solar radiation in Arequipa is high. The average of daily hours of sunlight is 10, and the difference between summer and winter is 30 minutes from the average.

Regarding the solar geometry, the sunlight is very vertical and it follows very uniform trajectory, as it can be deduced from its stereographic chart (**Fig 2.9**). Due to the fact that the city is located in the South hemisphere, the south facades in the building do not receive sunlight, except during the days near to the summer solstice (December 21<sup>st</sup>) (Almodóvar, op cit, 118)

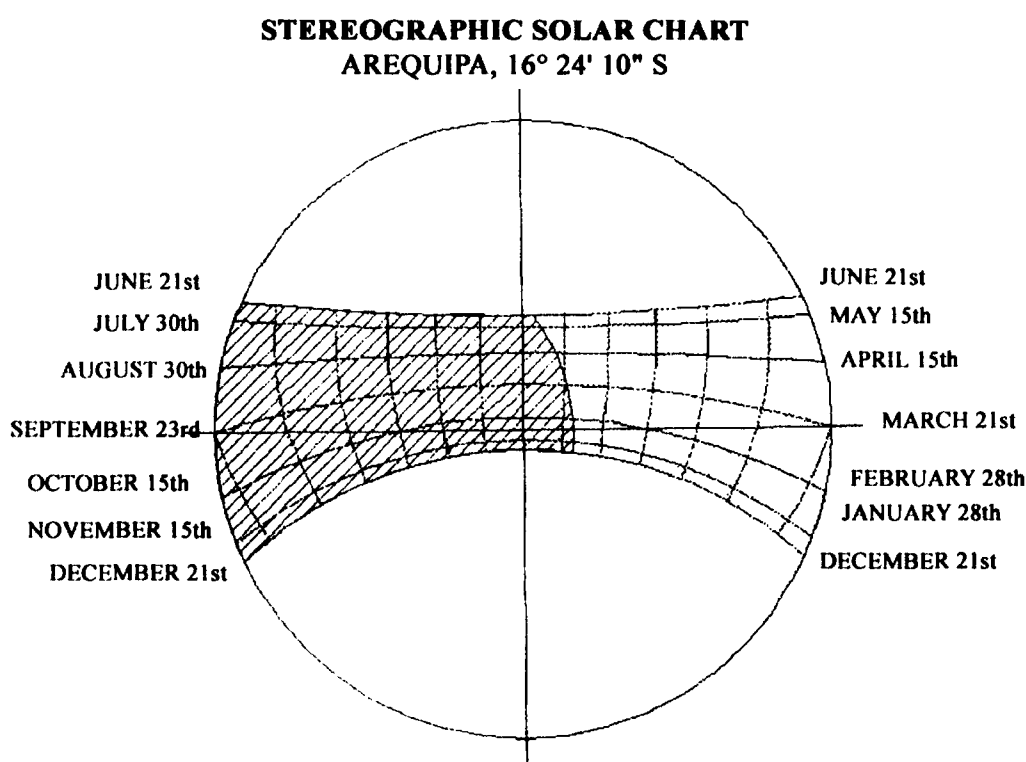


Fig 2.9. Stereographic Solar Chart in Arequipa, after Almodóvar, 2006

## (3) WINDS

Due to the presence of the Chila Volcanic Chain, located to the North and North West of Arequipa, and the hilly topography to the South East of the city there is a difference between the direction of the wind during the time of the day.

While the highest wind blows predominantly towards West during the daytime and East during the night, the superficial wind blows from West- Northwest and switches to East to Southeast during the night. (**Fig 2.10**) (PEGUP, op cit, 13)

The average speed of the wind in Arequipa is 3.5 m/s, however moderated stiff winds with speed until 15.3 m/s. However, typhoons, hurricanes nor twisters have ever been reported.



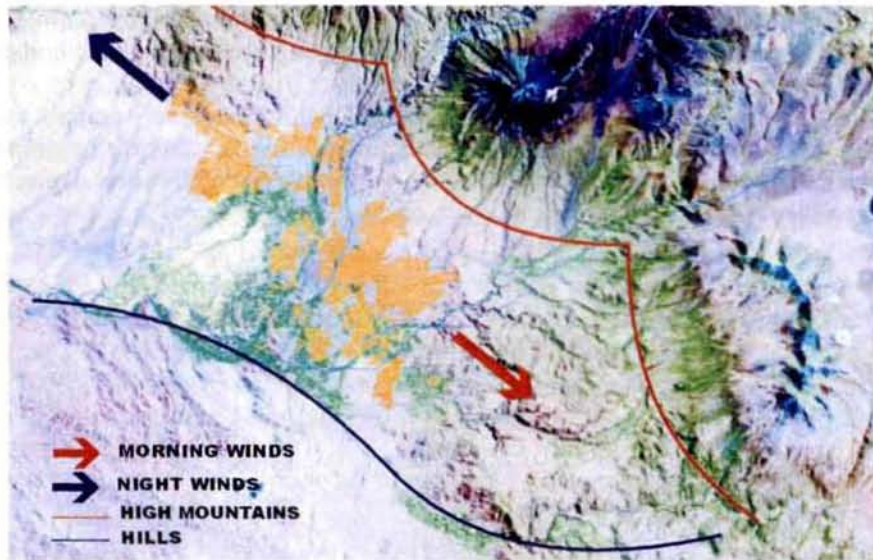


Fig 2.10. Winds in Arequipa during the morning and nighttime. Source: Atlas ambiental de Arequipa, 2000

#### (4) SYNOPSIS

The conditions of the desert climate with strong changes of temperature from day to night, conditioned special features in the architectural design, like the use of a central patio in the houses. This patio provided special microclimate conditions, by capturing the solar energy during the morning hours and refracted it into the inner rooms during the night. In that way, the rooms were milder at evening hours (Fig 2.11). Complementarily the use of a fountain in the patio added humidity to the dry weather.

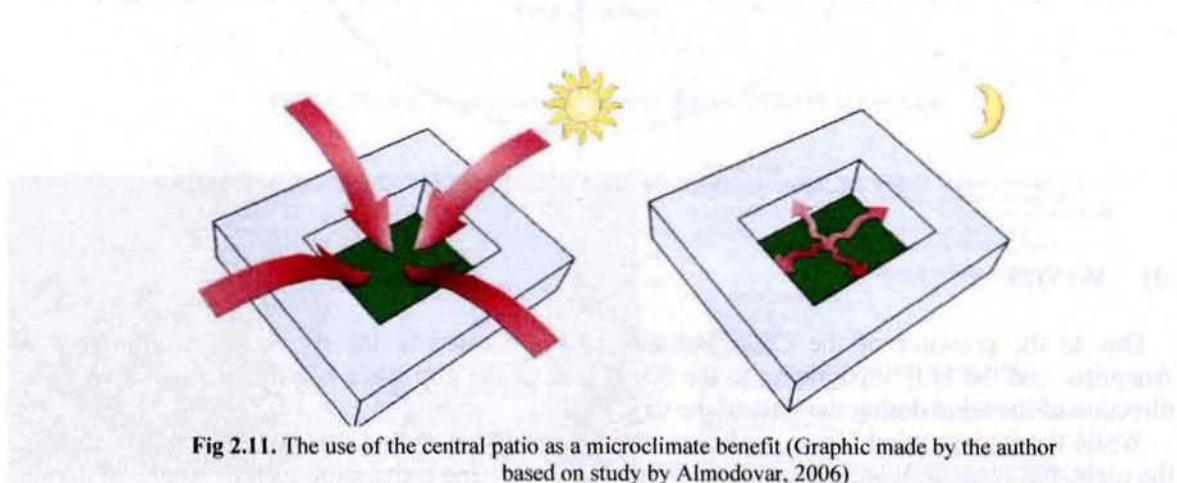


Fig 2.11. The use of the central patio as a microclimate benefit (Graphic made by the author based on study by Almodovar, 2006)

## 2.3 THE CHILI RIVER

### (1) RIVER ECOSYSTEMS

River ecosystems have been, throughout human history, indispensable resources for the survival and development of societies. These ecosystems include much more than the flow of water; they also provide the environment for a complex interaction of natural elements where ecologic, hydrologic and geomorphic processes take place.

Some important zones can be identified in a river ecosystem (Pineda, 2006) (Fig. 2.12).<sup>3</sup>

- **Channel:** A discrete area and significant element of surface water, which can be permanent or semi-permanent
- **Floodplain:** All land adjacent to a watercourse over which water flows in time of flood, or would be flooded but for the presence of flood defenses where they exist. The limits of the floodplain are defined by the peak water level of a flood event in the watercourse or at the coast. Within a floodplain, backwaters can exist.
- **Riparian zones:** A transitional zone, bordeing the edge of rivers, lakes, streams, ponds and wetlands, which exerts a direct influence on or is influenced by river and stream channels or lake margins and thus influences the water and aquatic ecosystems contained within them.

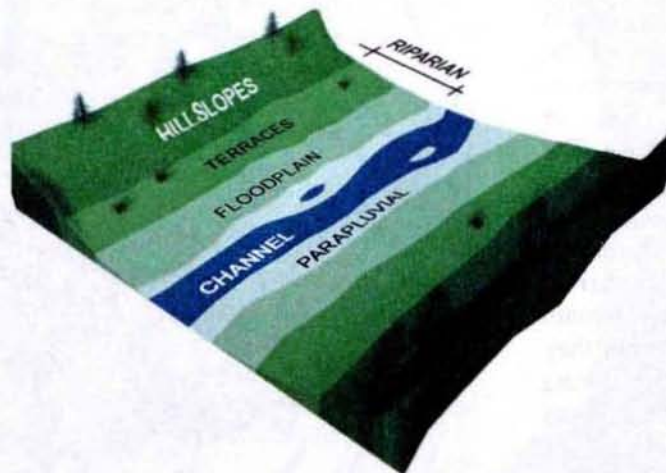


Fig 2.12. Structural components of river ecosystems. (3D made by the author after Tockner mentioned by Pineda.)

River ecosystems are basically composed by hydrological elements (water) and stable physical ones, which are the land (topography, geomorphology and soils) and vegetation. These elements interact with the man made elements in several ways: as a source of watter supply, for agriculture or productive activities, as energy resources, for transportation of goods and people and or recreational and aesthetic purposes.

For the analysis of the dimensions of the river ecosystems, some authos refer to the length (delimitating the upper, middle and low basin), width (including the terrain forms such as



channel, parapluvial, floodplain and riparian zones) and depth of rivers (including flowing water, the rock bed, the soils and the vegetation) (Wiens, 2002).

However, from a physical spatial approach, it is more important to identify spatial units of homogeneous characteristics that interact with the city in special areas, and where micro ecosystems are interrelated and interdependent.

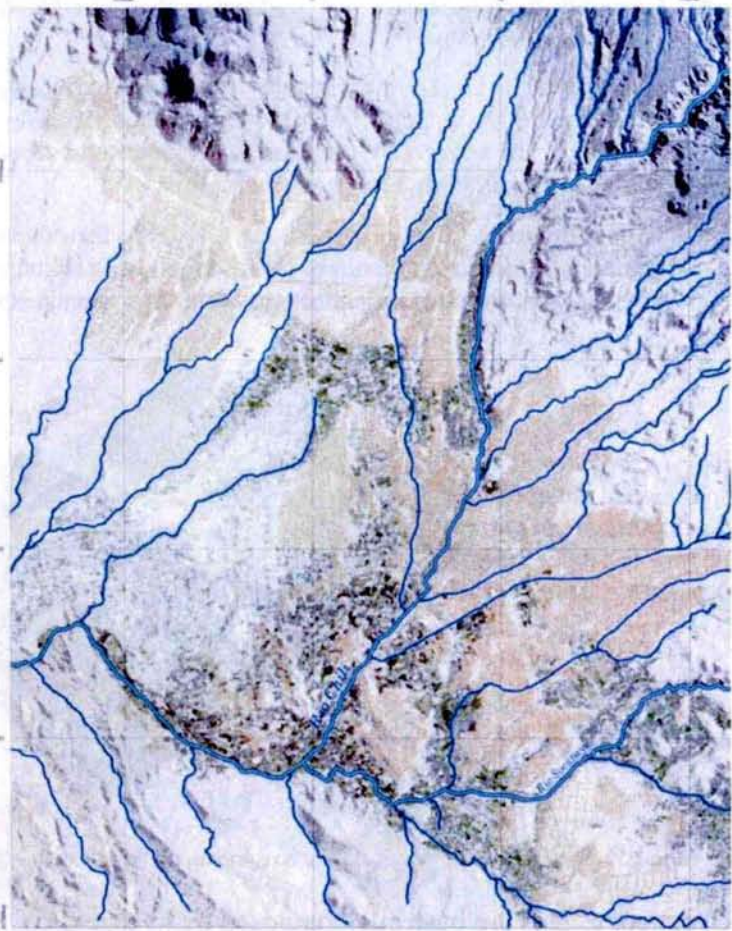
## (2) THE CHILI RIVER ECOSYSTEM

The Chili River, which is the main watercourse in Arequipa, crosses the arid desert generating a fertile valley.

The word Chili comes from “chiri”, that in native quechua language means “cold”, due to the cold water that flows from the iced high mountains (EGASA, 2003, 8)<sup>4</sup>.

The Chili River is born in the Andes in the joint of the Sumbay and Blanco rivers at an altitude of 3760 m (Zeballos, 2002, 96)<sup>5</sup>. The Chili River runs for 102 km and along its way it receives water from several *torreñeras* or seasonal torrents. (**Fig. 2.13**). These streams remain dry most of the year, but they can carry a major flow during the rainy season from December to March. The average volume of the water flow is 11.33 m<sup>3</sup>/seg, but it can reach the 110 m<sup>3</sup>/seg during rainy season (PEGUP, 2001, 11)<sup>6</sup>.

In the Southern part of the city, the small Socabaya River flows into the Chili River near the traditional town of Tiabaya. Finally, the Chili River joins the Yura River to form the Vitor River on its way towards the Pacific Ocean.



**Fig 2.13.** Hydrologic system of the Chili River in Arequipa. (Source: Atlas Ambiental de Arequipa, 2000)



### (3) GEOMORPHOLOGY OF THE CHILI BASIN

#### 1) The Metropolitan Basin

The region in which the Chili River traverses the urban areas of Arequipa is called the Metropolitan basin. This area starts in the north in Chapi Chico and it extends until the Tiabaya bridge in the South (Fig. 2.13).

However, the configuration of the terrain, the geomorphology of the valley, the way that the city interacts with the river basin, the views of the riverscape, etc. are not uniform along the Metropolitan Basin. The architecture types, the urban factory and the agricultural forms are also different.

Due to its different topographic, urban, land use, accessibility and socio cultural characteristics, and in order to facilitate a better understanding of the Metropolitan Basin, it has been divided in five zones that will be discussed in the following.

Zone A: Alto Cayma and Alto Selva Alegre

Zone B: Chilina

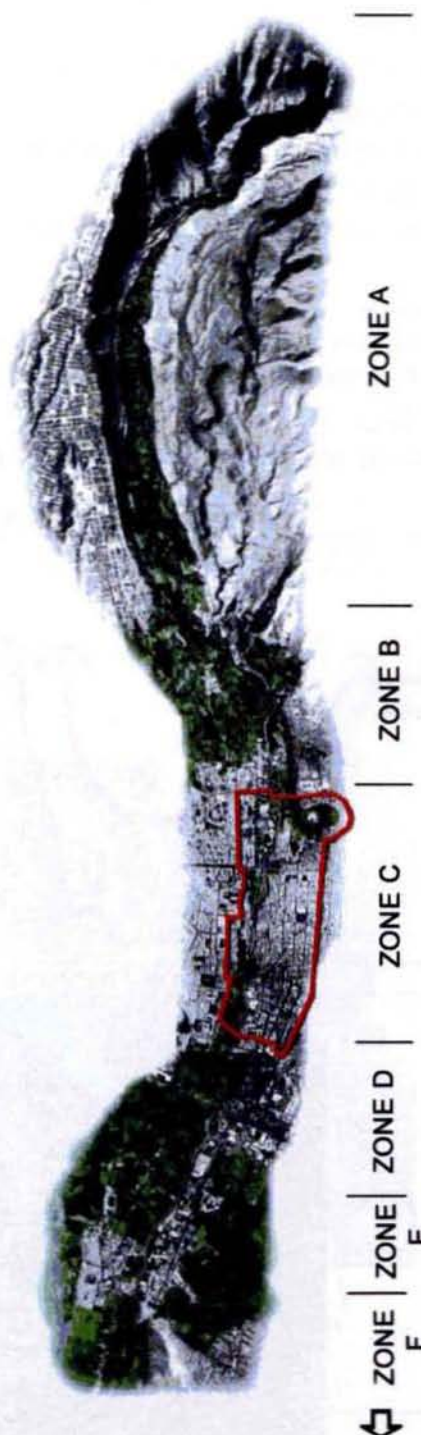
Zone C: Central Area

Zone D: Industrial Park

Zone E: Tingo

Zone F: Tiabaya

This research will be focused in the Zone C, but some facts in the Zone E will eventually be discussed.



**Fig 2.14.** The Chili Metropolitan Basin (Photo composition made by the author using aerial photos of Arequipa in 1997)

## 2) Zone A: Alto Selva Alegre

### Location

From the Chapi Chico Sanctuary to the area of Carmen Alto, Cayma.

### Topographic Relief

Steep topography, the valley is narrow and deep conforming the Chilina Canyon.

### West Bank

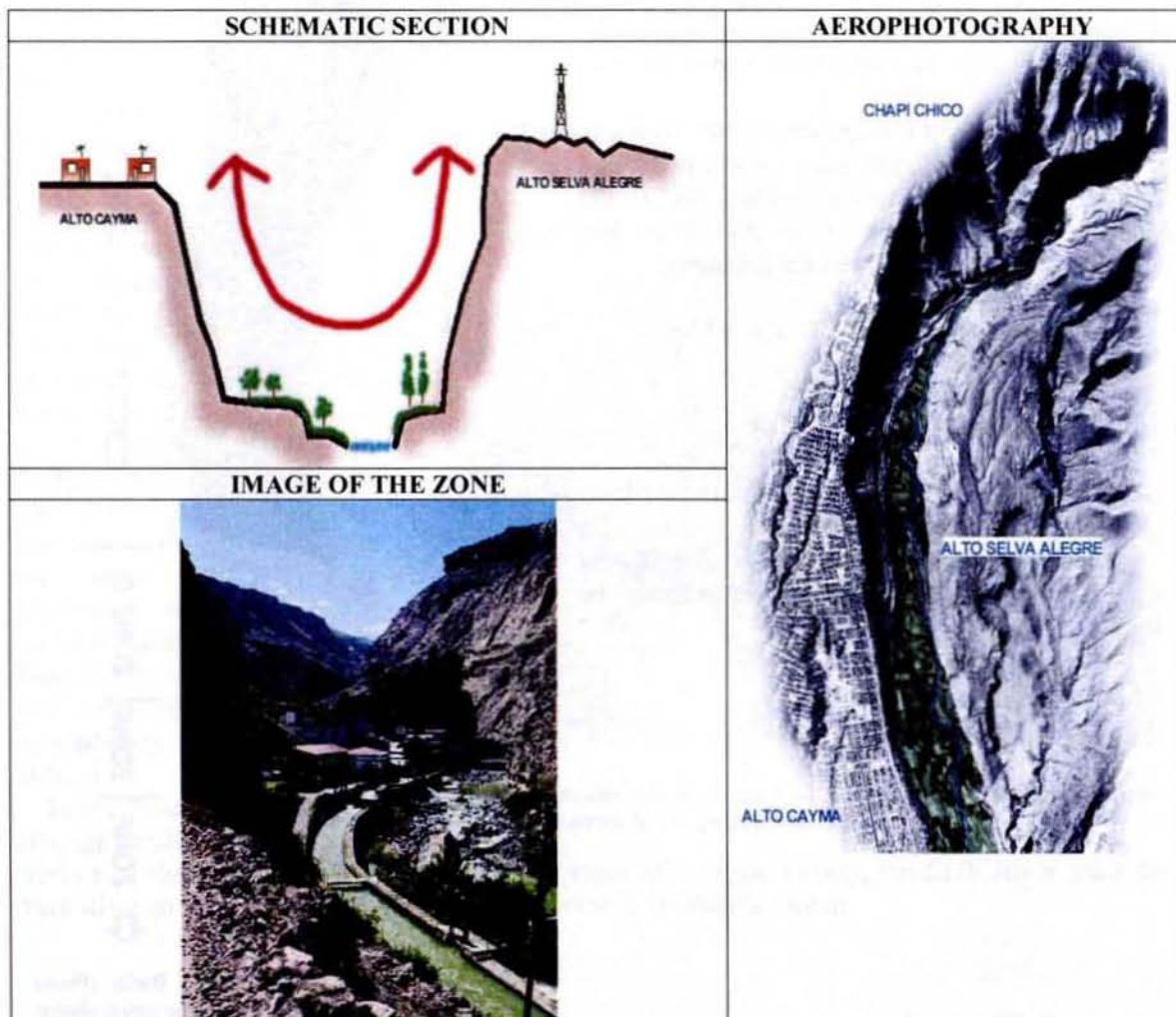
Agricultural fields in the lower area. From 1980 low-class dwellings have occupied the upper zone.

### East Bank

Eucalyptus woods and wild vegetation occupy the lower part. In the upper zone, there is the Alto Selva Alegre Ecological Park, with several types of flora and fauna from the desert.

### Land Uses

Housing, agriculture, Area of Natural Reserve.





### 3) Zone B: Chilina.

#### Location

From Carmen Alto to the Selva Alegre Park.

#### Topographic Relief

The Chilina Canyon becomes broader conforming a more open valley.

#### West Bank

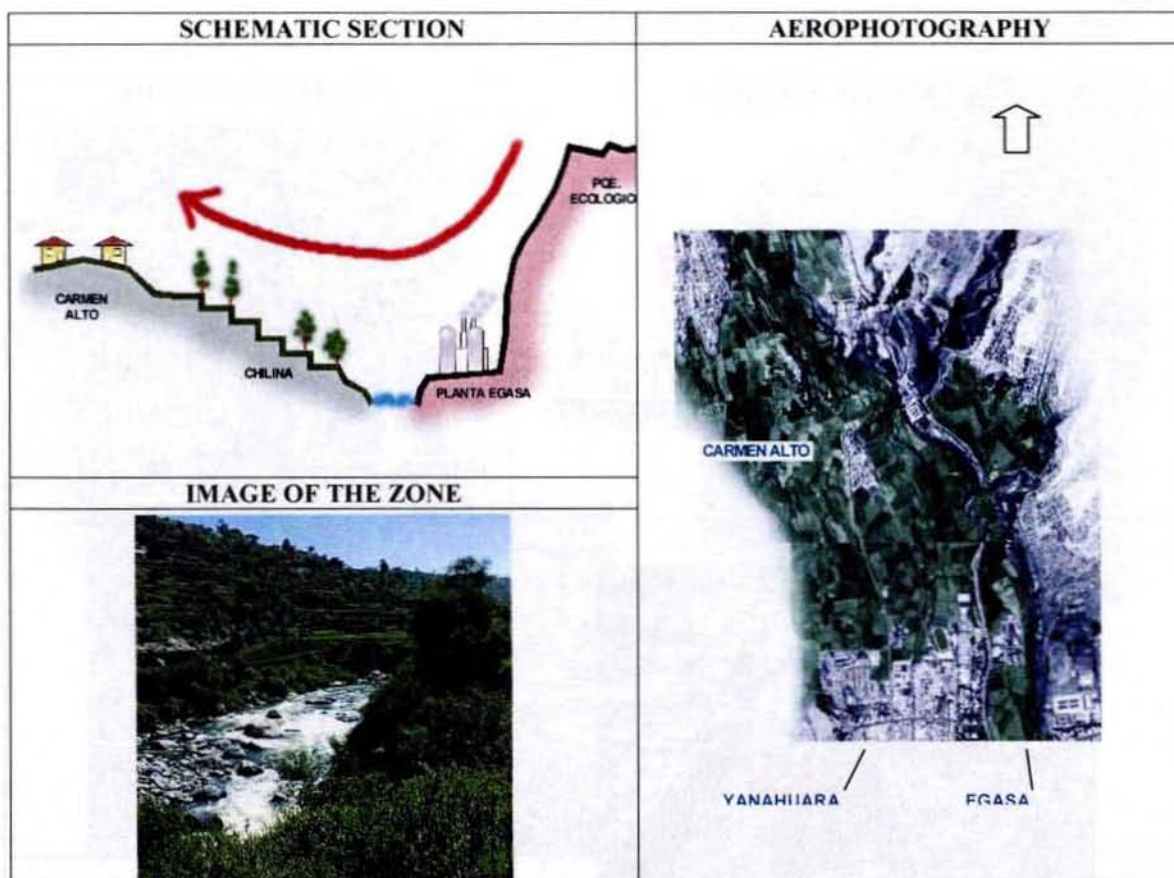
Agricultural terraces and traditional towns. Because of its remarkable landscape conditions some high-class housing appears scattered in the area. In the last decades many rural areas have become urban ones.

#### East Bank

The topography is more steep and rough. In the lower part the Thermo-Electric Plant is located. In the upper part there are low-class settlements.

#### Land Uses

Housing, agriculture, Electric Plant.



#### 4) Zone C: Central Area.

##### Location

From the Selva Alegre Park to the Vallecito Bridge.

##### Topographic Relief

The valley becomes open in the left bank, but it becomes a cliff in the right one.

##### West Bank

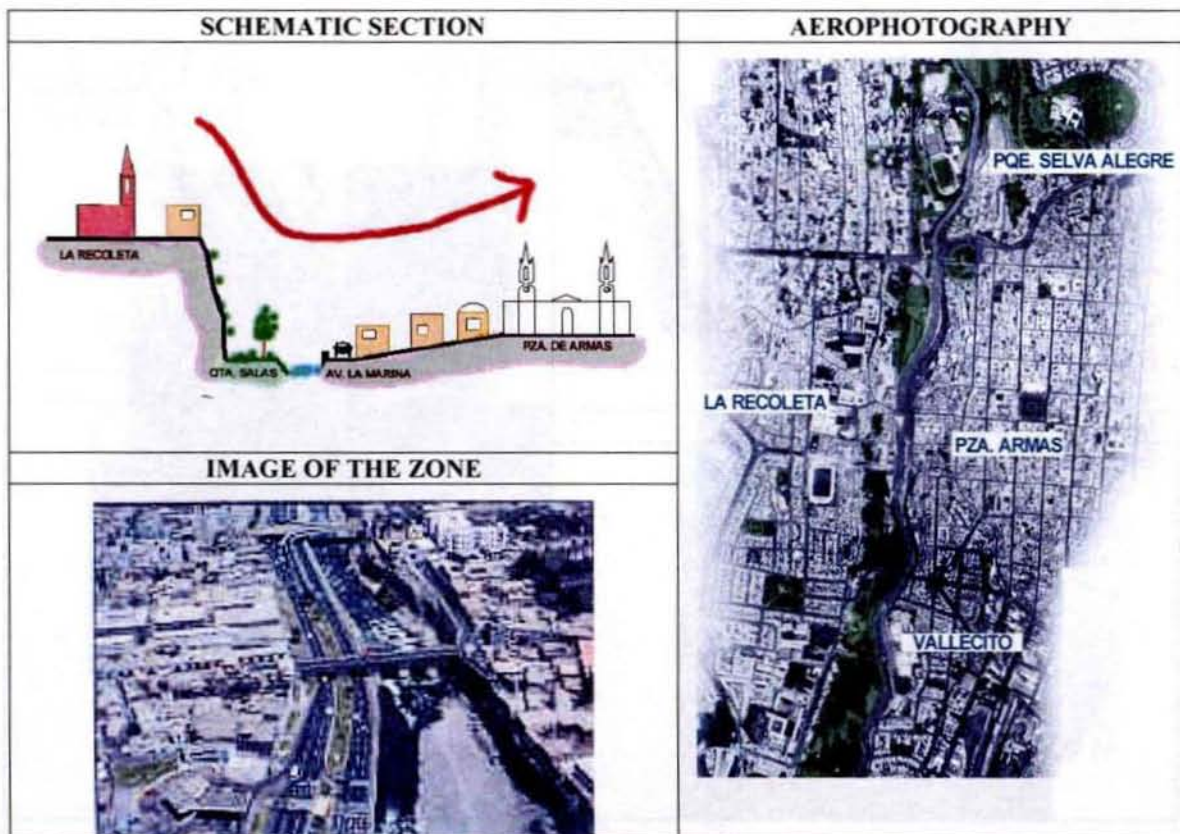
In the lower part few agricultural fields and also a traditional private sports club can be observed. In the upper part the neighborhood and church of La Recoleta are located, along with the Alameda Promenade.

##### East Bank

This is where the Spaniards founded the traditional city. There are many monuments in the area, including the stone bridges, but also some abandoned leather factories. In 1980 a high-speed avenue was built at the edge of the river, separating it from the pedestrian user. In 2000 UNESCO declared the area World Heritage

##### Land Uses

Middle class housing, services, commerce and metropolitan recreation.





## 5) Zone D: Industrial Park.

### Location

From the Vallecito Bridge to the Tingo seasonal stream.

### Topographic Relief

The valley becomes open in both banks. In 1870 an iron bridge, the longest in the world at that time, was built to support the railroad.

### West Bank

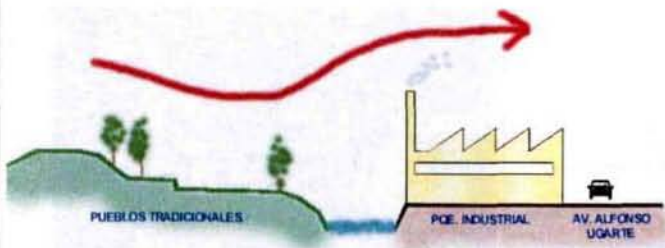


Agricultural fields and scarce housing areas. Wild bushes form the vegetation in riverbanks.

### East Bank

This zone used to have many swamps and therefore it was not cultivated nor inhabited. Only in 1960 an Industrial Park was created and from 1970 some high-middle-class schools were located in this area.

### Land Uses

Agricultural fields, middle class housing, industry.

SCHEMATIC SECTION	AEROPHOTOGRAPHY
	
IMAGE OF THE ZONE	
	

## 6) Zone E: Tingo.

### Location

Tingo and Sachaca traditional town.

### Topographic Relief

The valley is flat and surrounded by a chain of hills that protect the area from winds and favored the gush of several natural springs.

### West Bank

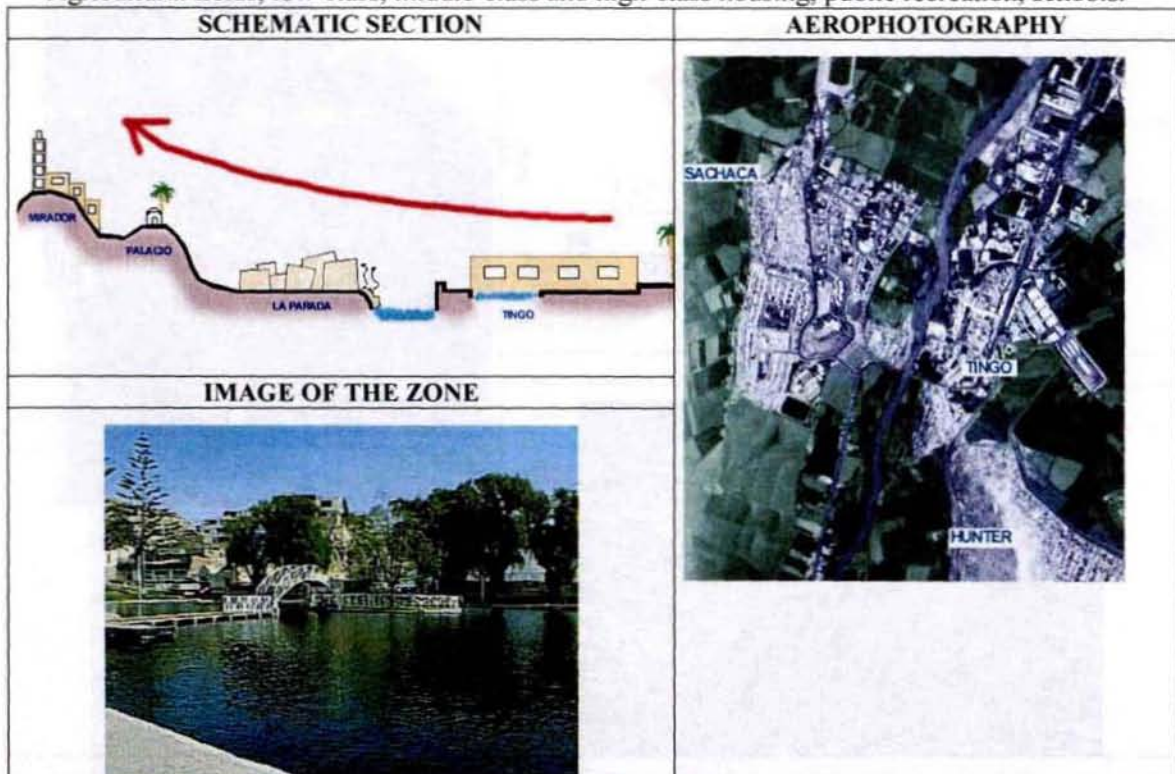
Composed by farms and hilly terrain. The Goyeneche Palace, a colonial mansion, is a traditional landmark in top a hill. Near the riverbank, an open market used to be located causing many environmental problems. Recently, it has been eradicated, and a riverfront park is planned to be built in the area.

### East Bank

Although there are remains of pre-Hispanic settlements, this zone was very modestly occupied during the colony. Because of the many springs, the area flourished as a traditional baths area in the beginning of the 20<sup>th</sup> century. Also, because o the construction of a railroad station a wooden architecture used to be frequent in this zone. Today is a traditional area with baths and local food.

### Land Uses

Agricultural fields, low-class, middle-class and high-class housing, public recreation, schools.





## 7) Zone F: Tiabaya.

### Location

From Tingo to Tiabaya Bridge.

### Topographic Relief

Relatively flat in both margins.

### West Bank

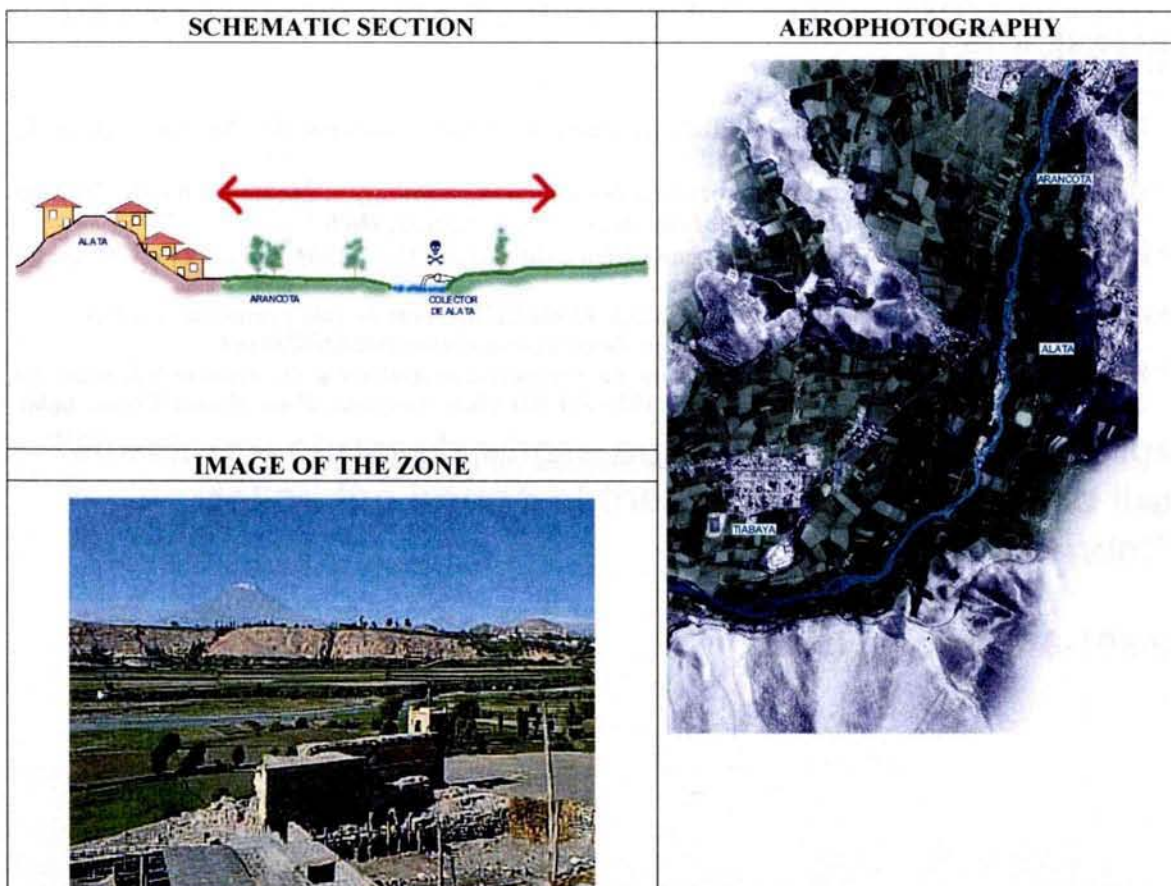
Agricultural fields and rural housing. This area is famous for its traditional cuisine, and for that reason many restaurants offering local food are located near the road. The traditional town of Tiabaya is located here.

### East Bank

Fertile agricultural fields and scarce housing. Near Tingo, there is an area of swamps and biodiversity. The railroad and a road for landscape views run in the edge of the fields and the hills. The traditional towns of Huasacache and Alata are located here. In the southernmost area, the city's sewage flows into the river from 1990, becoming an important source of pollution.

### Land Uses

Agricultural fields, rural housing, traditional restaurants.



## 2.3 SUMMARY

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The natural environment has strongly conditioned the characteristics of the cultural landscape, the urban development of Arequipa and the particular character of its architecture. The strategic location of the city amidst two ecological regions (the coast and the highlands) allowed the development of Arequipa as the most important economic center in the region. The topography and geomorphology were factors that conditioned the foundation and expansion of the urban layout of the city. The hilly topography and the scarcity of water for agriculture, determined a very rational use of this resource by the construction of agricultural terraces and water channels that modeled the landscape and provided foodstuff and livestock resources to the city.

Also, the mild weather during the whole year allowed the expansion and development of agricultural activities. The strong solar radiation and the changes of temperature from day to night influenced special characteristics of the architectural space. At the same time, the periodic occurrence of strong earthquakes motivated the improvement of the anti-seismic construction techniques and the use of more resistant materials, such as the white stone rock called *sillar* instead of the adobe. Nevertheless, the city had to be reconstructed several times due to these seismic activities.

The origin of the valley was the Chili River. The river affords different characteristics according to the configuration of the terrain and its contact with the urban fabric. It also offers a varied riverscape within a short way, becoming a very important landscape resource and natural heritage for the city.

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## **CHAPTER 3**

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### **DEVELOPMENT OF NEW STREET TYPES AROUND THE CHILI RIVER**

**“Streets are channels whose configuration and aesthetics  
define the image of the city and its relation to the  
environment”**

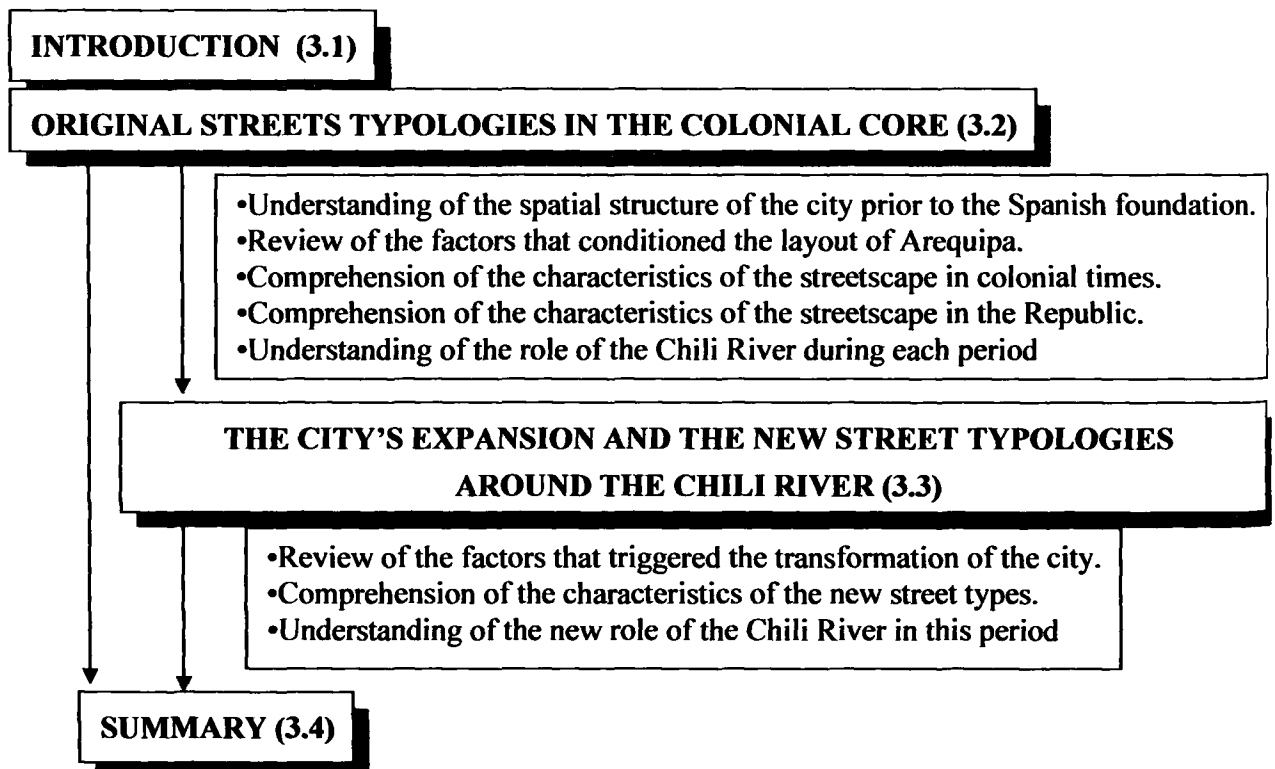
**Kevin Lynch (1918-1984)**

### 3.1 INTRODUCTION

This chapter aims to clarify the uniqueness of Arequipa's urban structure from the perspective of the evolution, and arrangement of its street types, as well as their relation with the landscape.

Most of the foregoing research on Arequipa's urban structure has hardly dealt with the spatial characteristics of the streetscape, or with the binomial city-landscape. Carpio's newspapers compilation of events in Arequipa from 1867 to 1911 (1983)<sup>1</sup> and the Gutierrez's study of the city's urban evolution from 1540 to 1990 (1992)<sup>2</sup> are useful to understand the historical and social economic context in which the streetscape evolved. Also, most of the studies, including UNESCO's, have been focused in the central core (16<sup>th</sup>-18<sup>th</sup> centuries). However, Arequipa's special character should be explained including the areas developed from 1870 to 1940, when landscape features were incorporated into the city's urban planning in the process of modernization.

To understand the complexity of Arequipa's urban structure, our study provides a different approach through the analysis of the streets as "channels whose configuration and aesthetics define the image of the city and its relation to the environment" (Lynch, 1960, 47)<sup>3</sup>. The spatial configuration of the streets, their cross- section and ratio materials, urban furniture and the composition of their contiguous architectural elements defined several typologies established the character of the image of the city and influenced in the perception of the surrounding landscape. The evolution of the streets in Arequipa is related not only to functional issues such as the movement of the population, but it has been influenced by social, cultural, technological and aesthetic factors. In addition, the evolution of the city and the relations between its urban patterns are explained using the study of representative street types.



### 3.2 ORIGINAL STREETS TYPES IN THE COLONIAL CORE

Arequipa was founded due to the existence of the Chili River. However, its urban structure not always favored a clear relation with the river areas. The evolution of the street typologies expresses the characteristics of the society and the changing role of the river in their conception of city planning.

#### (1) The Pre-Hispanic Organic Type (before 1540)

##### a) Historical background

Archaeological findings indicate that the fertile valley in which Arequipa is situated has been occupied back to 5000 – 6000 BC. Centuries before the arrival of the first Spaniards in 1539, the region was occupied by several groups of native inhabitants, such as the Yanahuaras and Yarabayas. In the 15th century, due to the climatic and geographical conditions of the valley, the region was subsequently conquered by the Incas (Fig. 3.1).

During this period, the economic relationships integrated the different ecological areas along the coastline and the highlands and were connected with the capital of the empire, Cusco. Arequipa's location was strategic for the exchange of goods from one area to another and provided important agricultural supplies to the Inca Empire (Fig. 3.2).

##### b) Physical-spatial configuration

The local communities in the Chili Valley were settled in organic, unplanned rural hamlets, scattered in both sides of the river (Fig. 3.3). These settlements were not organized cities like in other places in the Incan Empire; there were not palaces, nor temples, nor important buildings. They were just rural communities, located next to their agricultural fields and spontaneously organized according to the topography. However, they enjoyed an intimate closeness with nature, especially with the river and the seasonal streams, which were respected and worshipped as gods.

In 1540 the Spaniards grouped the native settlements in *reducciones* or neighborhoods for Indians, such as *San Lázaro* in the Eastern bank of the Chili River, next to a seasonal stream, and *Yanahuara*,



Fig. 3.1. Representation of the Inca foundation of Arequipa. Painting by Teodoro Núñez Ureta

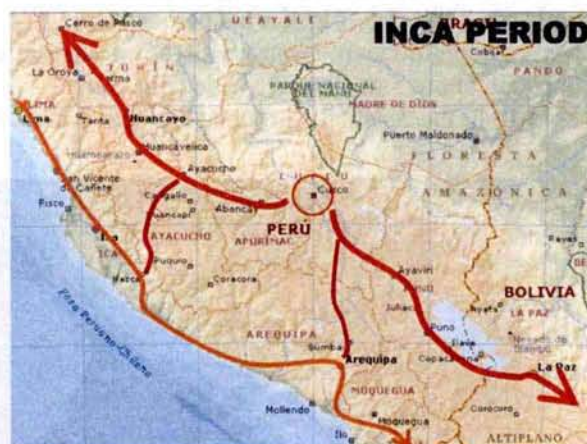


Fig. 3.2. Scheme of the regional relationship of Arequipa during the Inca Period (made by the author after Galdos,



located in the Western riverbank.

The physical characteristics of these settlements can be inferred by the chronicles of the conquerors discussed by Galdos (Galdos, 1990, 1993)<sup>4</sup> and by analyzing similar traditional towns (such as Sachaca) that conserved the same characteristics than the original Pre Hispanic rural settlements and which typical streetscape was kept until few decades ago (Fig. 3.4).

During Pre Inca and Inca times the overall form of the streetscape was organic, unplanned and spontaneous. The streets wounded organically showing a discontinuous urban skyline, lacking hierarchy as there was no main street nor temple nor important building. Local traditions ensured social cohesion in the intimate street nooks, while commercial activities were “exchanged outside the towns” (Gutierrez, op cit, 28).

Dwellings were made of adobe and covered with straw roofs, alternated with *pircas* or irregular fences made of stone and adobe located at the edge of their orchards. (Fig. 3.5, Fig. 3.6). The houses were discontinuously arranged defining organic undulating streets. The breadth of the roads was unequal, about 5 to 6 meters wide (Fig. 3.4).

In 1540 the Spaniards grouped the native inhabitants in *reducciones* or neighborhoods for Indians.

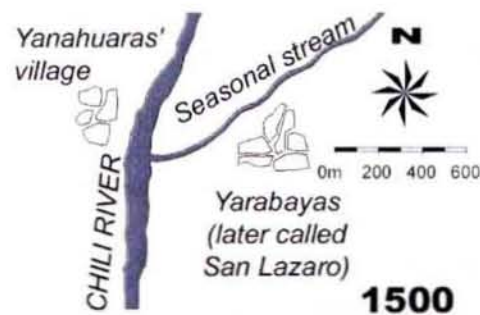


Fig. 3.3. Pre Hispanic Arequipa according to Galdos (1990).



Fig. 3.4. Photography of Sachaca at the end of XIX century, a traditional town with similar characteristics to the original settlement in San Lazaro. (Photo by Pardo, 1940)



Fig. 3.5. 3D model made by the author based on descriptions by Galdos and Gutierrez and pictures of similar settlements

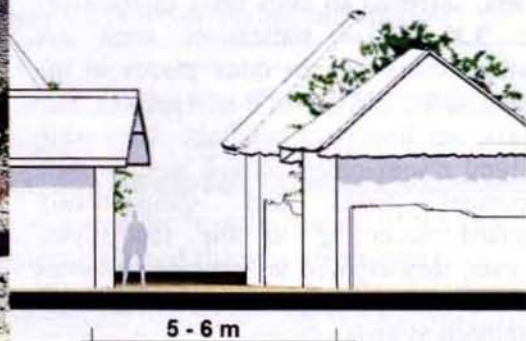


Fig. 3.6. Schematic section of Pre Hispanic street



**Fig. 3.7.** A street in San Lazaro before and after the Spanish colonization (3D model made by the author based on descriptions by Galdos and Gutierrez and pictures of similar settlements. Photo by Pardo, 1963)

Unlike the organic European medieval town, these native hamlets lacked spaces with hierarchy or special landmarks (cathedral, castle, monastery), conforming a more homogeneous townscape. The Spanish presence introduced urban elements as the chapel and the atrium for evangelization. The organic pattern was kept in San Lazaro while in Yanahuara a semi-organic layout was used, since the natives did not respect completely the gridiron imposed by the Spaniards.

The several reconstructions after the earthquakes and the improvement of techniques transformed these disperse rural alleys into a very compact streetscape. The narrow, 6 m wide streets conformed a width/height ratio of 0.8 to 1.0, creating a spatial sequence of directions while walking along the winding paths. (Fig. 3.7).

### c) Relationship with the river

The respect and worship that ancient Peruvians devoted to landscape and particularly to water and riverfronts dates from thousands of years before the arrival of Spaniards. (Kauffman, 2002)

Particularly during the Inca period, the development of cities was physically and symbolically integrated to landscape features. The ancient Peruvian enjoyed an intimate relationship with nature, especially with the rivers and the seasonal streams. That was the case of the Chili River, which was worshipped as a god. Aside of its role in agriculture, it served as a regional organizer of the territory. Along his way, it linked pre-Hispanic villages as Yarabaya, Umacollo, Tingo and Tiabaya. (Palomino, personal interview, 2004).

It was also important the transformation of the riverscape by the construction of terraces for agricultural purposes, modeling a cultural terraced landscape that became an effective solution for the production of goods, the control of floods and landslides, the cultivation of deserted areas and the gentle integration to the steeped topography of the valley.



### (3.2) The Hispanic Type (1540 – 1821)

#### a) Influences in the foundation of Hispanic cities in America

The gridiron layout model used by the Spaniards in the foundation of cities in the American continent was regulated in the Laws of the Indies by Phillip II. During the time of the conquest of the American continent, the Renaissance ideal urban models were being discussed in Europe. However, the model applied in America seemed to have been influenced by other different urban processes<sup>5</sup>:

1. **The gridiron pattern Roman city**, which was based in two perpendicular axes (the main roads *cardus maximus* and *decumanus maximus*), in whose intersection the forum or main square was located. Influences can be traced to the Greek city designed by Hipodamus in Mileto, and by the regulations suggested by Vitruvius in his *Ten Books on Architecture*.
2. **The process of innovation and diffusion of the medieval grid layout** during the foundation of cities along the so-called Santiago's Path during the Spanish Re-conquest of their territory from the Muslims (11th – 15th century).
3. **Francisco Eximeniç's Biblical model**, who, inspired in the Bible's book of the Revelations, theorized a grid-pattern Utopian city, in square proportions which was considered "beautiful like an ideal Jerusalem from Heaven, associating the main square as the throne of God". (Bielza de Ory, 2002)<sup>6</sup>.

#### b) Historical background

The previous organization of the territory, which favored equilibrium between the different ecological levels, was lost during the Spanish colonial times (Fig. 3.8). The most important task for the Spaniards was to plunder the treasures of their colonies and take them to Spain. For that purpose, they linked the mines of precious metals located in the highlands to the harbors in the coast, and therefore, differently from the previous époque, the agriculture was less important than the mining industry.

Hence, Arequipa was founded as a geopolitically important center between the highlands and the coast, becoming a strategic



Fig. 3.8. Regional scheme in Spanish Period, based on the extraction of gold and silver from the mountains to the coast and then to Spain (made by the author after Quiroz)



Fig. 3.9. Representation of the Inca foundation of Arequipa. Painting by Teodoro Núñez Ureta.

area for collecting the silver extracted from the mines in Chivay and Potosi and then delivering it to the harbor in Quilca (**Fig. 3.8**). It was also important for the agricultural production and for the exchange of goods, due to its mild weather and its location amidst various ecological areas.

In 1539 the Spaniards founded a city in the location of Camana, near the coast, but due to the fact that many conquistadores suffered fever and other sicknesses, the village was re-located to the valley of Arequipa, where a new city was founded in 1540 as the "*Villa Hermosa de Arequipa*" (Beautiful Village of Arequipa) (**Fig. 3.9**).

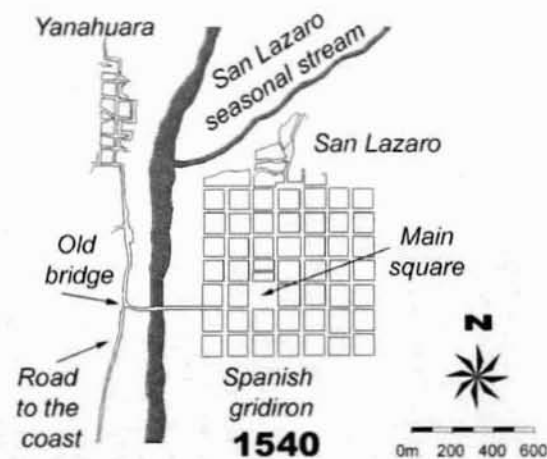
#### b) Physical-spatial configuration

In 1540 the conquerors founded a 49-blocks gridiron pattern city inhabited only by Spaniards, while the native Indians occupied the organic *reducciones*. In that way, the ethnic and social segregation was expressed in the different layout and location of the neighborhoods for the conquerors and for the conquered people.

The gridiron layout with a central square was chosen both for functional and symbolic considerations (Bielza de Ory, op cit, 2002). The city was introverted, centripetally arranged around the Main Square (**Fig. 3.10**).

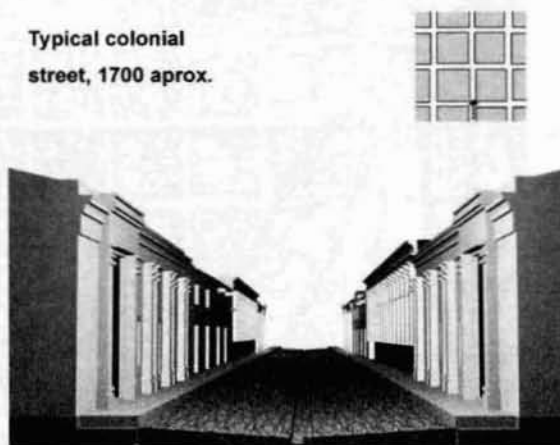
Manuel Garcí de Carbajal founded the city formed by 49 blocks; each block was a square of 110 m per side. The gridiron layout was also a square formed by 7 blocks per side and the streets were 10.3 m and it was rotated 20° with respect to the North. The urban layout is aligned to the Chili River and rotated diagonally respect to the topography, in order to facilitate an easier evacuation of the rain water. After decades, some of the blocks occupied by monasteries or convents were modified becoming longer. In the center of the grid, although not the geometrical center but moved closer to the river, the Main Square was located, and around it the main religious, political and administrative functions were located.

The streetscape in the colonial grid was characterized by its horizontality and homogeneity, only interrupted by the towers of the churches (**Fig. 3.11**). Every street had the same spatial hierarchy and cross-section, regardless activities around them. Some streets, like the one following the Old Bridge, held more dynamic activities, but this dynamism was not expressed in a broader section. The streets were basically straight, approximately "10 m wide with a 1.5 m sidewalk on each side" (Fioretti, 1868)<sup>7</sup> and the ratio between the breadth of the street and the height of the construction



**Fig. 3.10.** 1540 Arequipa according to Galdos (1990).

**Typical colonial street, 1700 aprox.**



**Fig. 3.11.** Perspective made by the author based on Travada y Cordova (1752) and Gutierrez (1992)

was 2.2. By the middle of the XVII century the streets around the Main Square were paved. The paving was made of pebbles, with a 0.5 m water canal running in the middle, which served both for carrying water to the orchards in the houses and for evacuating their wastes (Carpio, 1984, 4)<sup>8</sup>.

The following map (**Fig. 3.12, Appendix 1**), drawn in 1784 by Antonio Alvarez y Jimenez, is an interesting colonial document depicting a uniform character of the streetscape, where the most visible landmarks were the churches, and the most important space was the main square. The orchards in the temples are also depicted, as well as some agricultural plots. The area next to the river is shown as empty

The houses had one story, about 5-6 meters high. They were introverted, with no setback towards the street and organized around one or more internal patios connected by corridors. This configuration had microclimate benefits, because the patio captures the heat in the morning

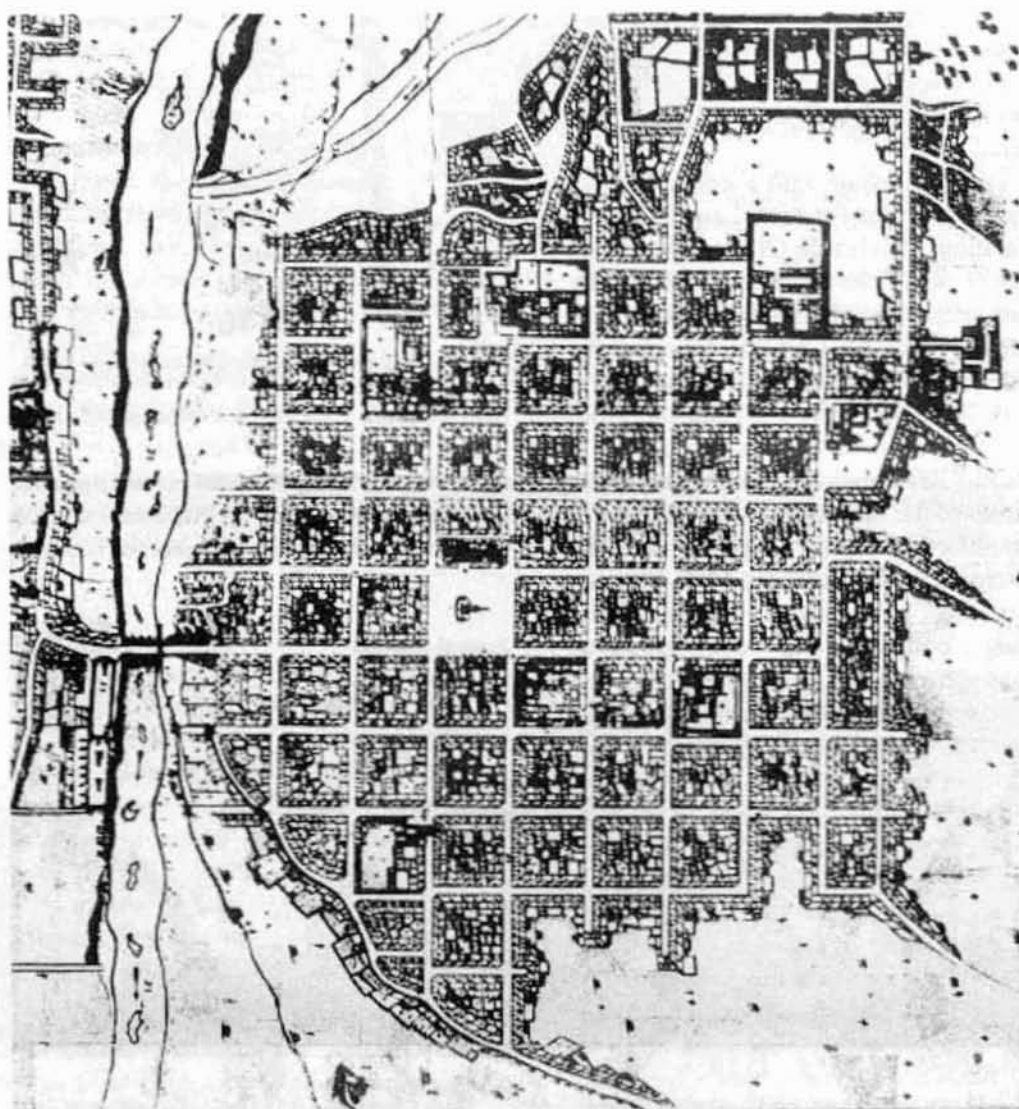


Fig. 3.12. Detail of the 1784 Map made by Velez for the Mayor Alvarez & Jimenez



distributing it to the rooms around it, compensating the shifts of temperature during the day and night (Fig. 3.13).

The material utilized in the construction of the houses in the XVI century was the adobe, but after the continuous earthquakes the material was replaced by a white volcanic stone called *sillar*, whose porous composition makes it easy to carve and work with. According to Travada y Córdova in 1752, there were three kinds of building covers: the houses with a straw roof, the ones with tiles and the ones with stone and mortar (Travada, 1752, 86)<sup>9</sup>. "The houses with straw roof were few and they were generally located in the outskirts of the city (such as San Lazaro). The houses with tile roof are the most common ones and the houses with stone and mortar roof were about one third of the total of dwellings" (Travada, op cit, 85). As Eusebio Quiroz mentioned, the city viewed from above had concentric circles around the main square with white (stone vaults), red (tiles) and yellow color (straw)<sup>10</sup>.

The mansions were arranged side-by-side forming a very continuous streetscape, marked by the compactness of the urban fabric and the massive character of the walls (made in a white volcanic rock called *sillar*). The continuous cornices and the few small openings in the walls accented the horizontality of the skyline.

### c) Relationship with the river

The Spaniards, guided by strict and conservative Catholic principles, forbade to Indians any worship attached to the river. For the conquerors, it was considered a geographic barrier, the back of the city known as *La Barranca* (the cliff).

In the areas of contact with the city, productive functions were associated and located near the river, such as orchards, mills and slaughter-houses. However, in moment of the foundation no public spaces were attached to the riverbanks.

The first stone bridge, later called Old Bridge, was built in 1558 connecting the two riverbanks, which were. At the end of the XVIII century, the river was used as a viewpoint and the Alameda Promenade was attached to it.

a) Hispanic/Republican type mansion (XVII-XIX century)

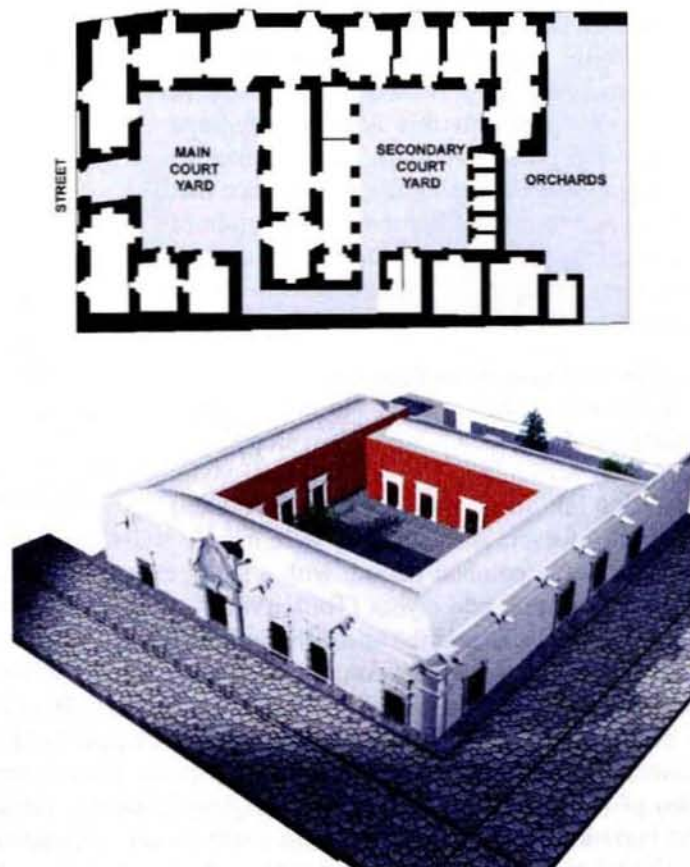


Fig 3.13. The typical colonial house had no setback, organized around one or various interior courtyards. Plan and 3D made by the author based on field survey.

### (3.3) The Republican Type (1821-1868)

#### a) Historical background

After gaining the independence in 1821, the trade with non-Spanish Europeans was increased, especially related to the trade of alpaca wool. Due to this activity, Arequipa became the most important urban center in Southern Peru, exceeding the significance that Cuzco used to have. After the consolidation of a new aristocracy, which welcomed European merchants, Arequipa competed with Lima for a social, political and economical hegemony.

#### b) Physical-spatial configuration

Influenced by new ideals, novel architectural models were developed in Arequipa, particularly the neo-classical style, importing an ideal image of the "cultured world". However, those changes were mainly stylistic, and Arequipa's urban structure remained the same as in the colonial period, with a small expansion towards the south and east, but in general keeping the same grid layout (Tord, 1988)<sup>11</sup> (Fig. 3.14). The city did not expand horizontally, but did grow vertically, and the occupation of the blocks became denser.

However, relative expansion can be observed through the roads leading to other towns, like the road to Tingo in the South and Yanahuara in the North West in the other side of the river. (Fig. 3.14).

The compactness of the Hispanic Type street continued, while the sensation of enclosure was accented by the addition of a second story in the houses, modifying the relation width/height to a ratio of 1.2 to 1.4 (Fig 3.15). The protruding balconies, cornices, and bases accented the continuity and horizontality of the urban profile, rhythmically interrupted by the porticos in the mansions.

The relation of the houses with the outside remained basically the same as in the colony, without setback towards the street and organized around a patio, with balconies added around the central



Fig. 3.15. Map was based on the one made by Francisco Velez in March 1793, published by Tord. (1988).

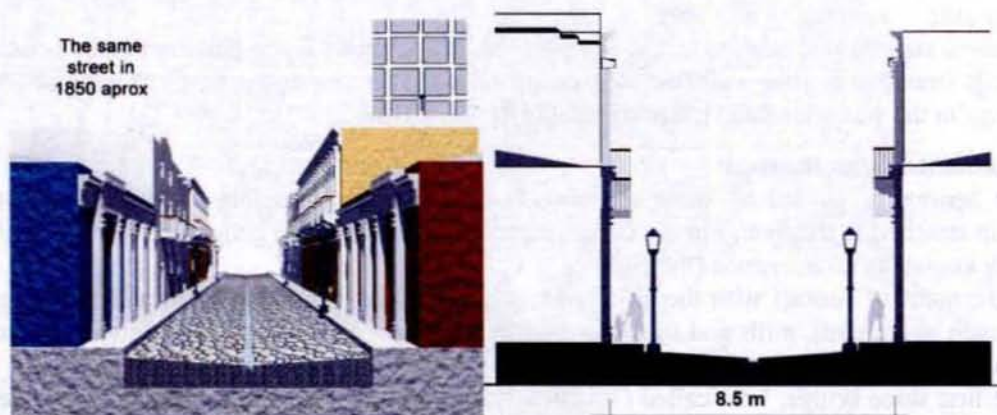


Fig. 3.15. Perspective made by the author based on Carpio (1983), Gutierrez (1992) and field survey



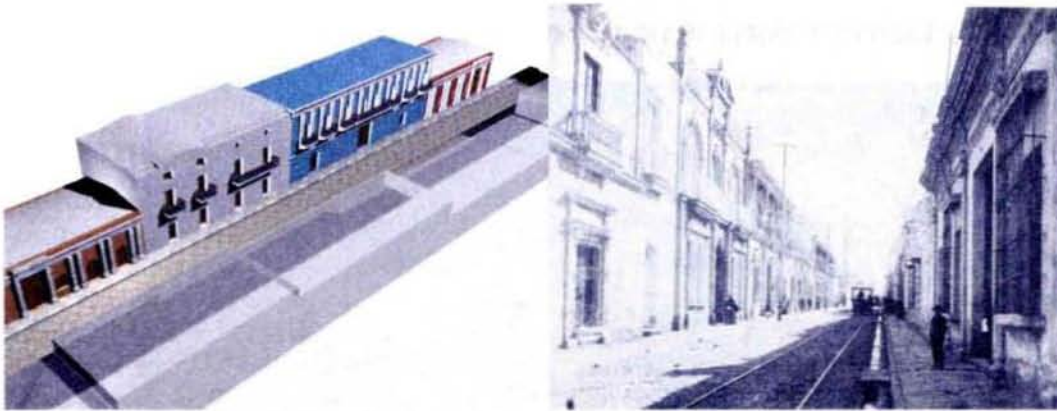


Fig. 3.16. Perspective made by the author based on Travada (1752) and Gutierrez (1992). Photo by Vargas (1890).

courtyard.

The sidewalks were made of stone slab and gas street lamps were added for night illumination. The central water canal remained exposed until the end of 19th century, when the underground sewage was built. The pebble-stoned pavements were not changed to cobblestone until 1931 (Fig 3.16). In the outskirts it was common the construction of isolated *quintas* or summer palaces by the aristocracy.

### c) Relationship with the riverscape

In the first decades of the Republic the riverbank continued housing productive activities, such mills and slaughterhouses, and it continued its reputation as an “unsafe place” (A local legend told about a mermaid who seduced to everybody whoever approached the river at night, disappearing for ever<sup>12</sup>). Besides, before 1868, Arequipa occupied a surface of 200 hectares. Only 2.6 hectares of them (0.6%) corresponded to public spaces related to the river.

However, some specific projects indicate the beginning of a change in the attitude to the riverfront areas. For instance, some houses built balconies towards the riverscape (Blanco, 1834)<sup>81</sup>.

The following map was made by Goyeneche in the first decades of the XIX century. There are some unusual interesting aspects depicted in the map that denote a special interest of the author for the landscape features.

- 1) **The surrounding volcanoes:** which are depicted much closer than their real location. They are the most remarkable natural landmarks in the landscape.
- 2) **The farms:** the rural role of Arequipa is accented. Agricultural fields become a recurrent theme in poems and songs.
- 3) **The urban fabric:** painted in red, differentiates the urban from the non urban. The outskirts are depicted as spots, to symbolize their lack of continuity and urban configuration.
- 4) **The churches:** which were the most important urban landmarks due to architectural, religious and cultural reasons.
- 5) **The main square:** depicted with its central fountain.
- 6) **The river:** it is depicted with detail, including waterfalls and the stones in the riverbed. Riverfront facilities such as the Old Bridge and the Alameda Promenade are also illustrated.
- 7) **The seasonal torrents:** the San Lazaro seasonal stream is depicted bigger than the others, due to its proximity to the urban area.
- 8) **The traditional towns,** which are often represented only by their church. Especial interest has the town of Tingo, located next to the river and depicted with its traditional baths.
- 9) **The rural paths** that connected to the traditional towns.



Fig. 3.17. 1835 map by Rodriguez, showing the Main Square, the campaniles of the churches, the Chili river and Old Bridge and the orchards in the riverbanks. The separation city/river is marked by a soft shadow representing the "cliff"

#### (3.4) Synopsis

The typologies located in the central core formed two clearly distinguished quarters: the organic one characterized by the Pre-Hispanic type, representative from the area of San Lazaro; and the gridiron, where the Hispanic and Republican co-existed together. While there are some streets typically Hispanic and others are predominantly Republican, most of the streets combined the two types.



### 3.3 THE EXPANSION OF THE CITY AND THE NEW STREET TYPOLOGIES AROUND THE CHILI RIVER.

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#### (3.1) The Tree-Lined Type

##### a) Historical background

In the second half of the 19th century more specifically after 1868, the Arequipan society underwent a process of transformation, influenced by important economic, social and cultural factors that triggered the development of new street types. The main factors that caused the aforementioned evolution were:

1. **Increase of trade with Europe**, particularly the exportation of alpaca wool<sup>13</sup>. Many European wool trade companies were settled in Arequipa. These European merchants brought new aesthetical and philosophical ideals (Carpio, op cit, 158), influencing local people's aim to create a city resembling a garden (Maldonado pers comm. 2004).

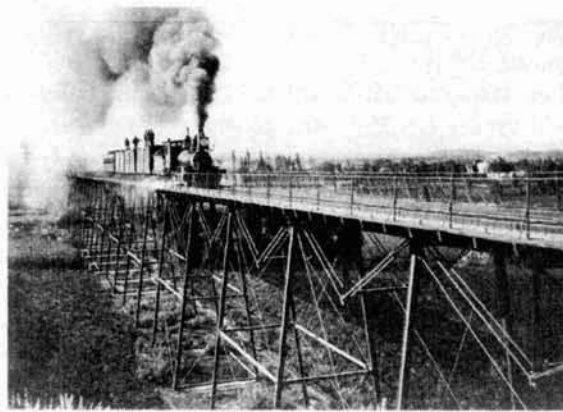
2. **The August 13, 1868 earthquake** that devastated most of the buildings in Arequipa. According to the United States Geological Survey USGS Earthquake Hazard Program, the earthquake magnitude was approximately 9.0<sup>14</sup> (**Fig 3.18**). The disaster was so devastating that left only three buildings without damage and for that reason technicians and engineers from Lima suggested to move city to another location, re-founding it with broader streets and similar spaces. However, the Arequipan people chose to respect their heritage and started a long reconstruction process. Nevertheless, the earthquake became a breakpoint in the city's urban expansion, since the authorities consider it a safer alternative than the construction in a second level (Gutierrez, op cit, 155). Also, novel urban patterns, new techniques and materials were utilized after the city's reconstruction.



Fig. 3.18. Effects of the devastating earthquake on August 13<sup>th</sup> 1868.

3. **The construction of the railroad**, which connected Arequipa. The railroad to the coast, inaugurated on January 1<sup>st</sup> 1868 was an attempt made by the government in order to recover the economy of the region after the disaster. After the completion of the routed Arequipa-Mollendo in the coast, the railway was extended from Arequipa to Puno in the highlands. The construction of the railroad consolidated Arequipa's role as main economic center in the region, despite its location far from the sea. The railroad eased the exportation of alpaca wool and the importation of goods, materials and, especially, visitors to Arequipa. Aside of its economic role, the construction of the railroad influenced other aspects from the urban architectural point of view, such as:

- The erection of the first iron bridge, which was the longest bridge in the world at the time of its construction. However the so called Puente de Fierro (Iron Bridge) was used only for the trains arriving to Arequipa from the highlands (**Fig 3.19**).
- The Train station, which became an important urban center of development in the South of Arequipa. The station was connected the city by the first tree boulevard in Arequipa, as a symbol of welcome. Besides, the train station introduced new architectural styles in Arequipa, such as Art Noveau ornaments, made in forged iron (**Fig 3.20**).
- The houses of the Railways Company, that employed aesthetical patterns typical from Europe, specifically from England, where the staff members came from.
- The use of new materials in the construction of buildings, like the rails, which were employed to reinforce the structure of the slabs due to their anti-seismic properties



**Fig. 3.19.** The train to the coast crossing the Iron Bridge, the world's longest at that time. Photo Vargas 1885



**Fig. 3.20.** The train station with its innovative architectural style. Photo Vargas 1885

**4. The revaluation of landscape.** The influence of the Hygienism movement aimed the creation of a “clean”, “healthy” society and therefore of a new moral order. According to Quiroz (personal comm., 2005) foreigners that arrived in the 19th century were impressed by the “exceptional scenery formed by the ravine of the river, the colorful farms and the majestic volcanoes”, recalling the attention of the locals to their own landscape resources.

From 1900 to 1920 the city experienced economic prosperity, due to the boom of exportation of alpaca wool to Europe. Several public facilities were built (such as hospitals, schools, markets and theaters) and new services were implemented, (i.e. the electric tram and electric illumination), “regaining people’s enthusiasm after suffering disasters like the 1868 earthquake and the Chilean occupation during the Peru-Chile war (1883)” (Gutierrez, op cit, 175).

In 1940 Arequipa celebrated its 4th centennial with several projects and new developments<sup>8)</sup>. Over 200 of the 542 hectares (37.0%) were occupied by landscaped urban spaces (in comparison to 0.5% in colonial times), located especially in the proximities of the river, such as parks, promenades and streets with trees (**Fig. 3.21**). The new urban patterns combined European influences with local skills, especially in the areas outside the colonial core.

#### b) Physical-spatial configuration

The inclusion of trees in streets in a boulevard-like arrangement was a revolutionary concept in the urban planning of Arequipa, combining the ideals of modernity while maintaining the closeness with nature. The boulevards, aside from beautifying the city, also provided a microclimate benefit, lessening the effects of the dry weather conditions and the high solar incidence in Arequipa. The trees emphasized the hierarchy given to the roads, contrasting with the uniform character of the colonial core. The linear succession of trees and other urban furniture generated a rhythmic pattern, accenting the directionality and generating an invitation to stroll along the tree-lined avenues.

At the same time, a new pattern of houses introduced generous setbacks, sometimes as wide as 40 m. The compact colonial house with central patio in the central core contrasted with a freestanding house surrounded by gardens, with front and back yards and lateral corridors (**Fig 3.22**). This typology was primarily used in the proximities of the train station, where the Englishmen employees of the Peruvian Railroads Company built their houses using European styles with local materials (Carpio, 2005, personal communication). Gradually, this pattern became popular in most of the new suburbs in the city. The homogeneity and continuity of the Hispanic and Republican Type streets was confronted with the individuality, discontinuity and



**Fig 3.21.** 1940 map is taken from the Plan made by De Rivero (De Rivero, 1940)<sup>9)</sup> and Aerial-photography Arequipa, 1944.



heterogeneity of the chalets, which receded from the sidewalk with wide setbacks. The inclusion of greenery in the streets helped to make uniform this diffuse urban profile.

Another consequence of the insertion of trees was the enhancement of the breadth in the streets in 50 to 70% with respect to the Hispanic Type ones. The width of the streets became broader, with a width/height ratio of 2.5 or more. In addition, the garden in front of the houses, separated from the sidewalk by a transparent fence, visually increased this relation to about 3.5. Thus, the boundary between the street space and the beginning of the private property, which was so strongly defined in the Hispanic street, became more diffuse, creating a layered effect with the walls behind and above the adjacent fences (Fig. 3.23).

The street with trees resembled the ideals of modernity and closeness to nature aforementioned. According to its layout and overall form, the boulevards were generally straight or undulating.

#### 1) The Straight Tree-Lined Type

In the end of 19th century the French boulevard was considered the paradigm of beauty and modernity in the "cultured" world. However, unlike in Paris, the construction of boulevards in Arequipa did not involve the destruction of hundreds of dwellings nor caused a social trauma. The expansion was made either over existing roads or occupying rural plots. Secondly, the skyline in Arequipa is much more dispersing than the compact streets in Paris; therefore the sensation of openness was broader in the Peruvian case. Furthermore, because of a limited budget, the scale of the developments in Arequipa was more modest.

The arrangement of the greenery in the roads was not only a matter of esthetics, but it also favored a different behavioral use of the street space.

The more common type of straight boulevard was the one locating the trees at each side of the street, accenting the idea of

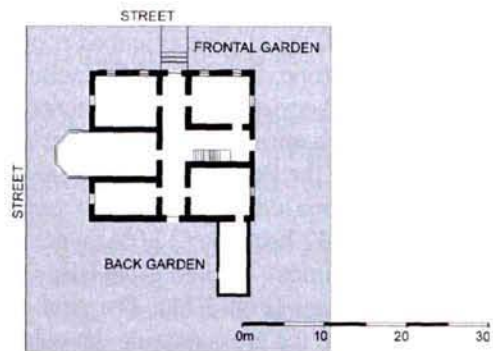


Fig 3.22. The houses with setbacks in the tree-lined streets enhanced the spatial sensation of the streetscape. 3D made by the author based on field survey.



Fig. 3.23. Parra Boulevard. 3D based on Carpio (1983) and on field survey. Photo Vargas 1926.



leading, and consequently, of walking along. The first and most important example was the Parra Boulevard (j) in Fig 3.21, 3.23). The Mayor Juan Parra del Riego built in 1871 the first linear Boulevard in Arequipa, connecting the Hispanic grid to the train main station. The Parra Blvd. had an important significance: it symbolized Arequipa welcoming to its visitors arriving by train, which was considered an emblem of modernity. Therefore the Parra Blvd was carefully designed, including greenery, urban furniture, flowerpots and even statues. The Melgar Park was located in front of the Station as initial point of the boulevard, being used as meeting area by the passengers and their relatives. Since the Parra Blvd was not located next to the Chili River, the Martinez Blvd. was built to connect it to the riverfront (Fig 3.26).

While the trees in the sides of the street accented directionality, the location of trees in the middle of the road made possible the development of social gathering. Pedestrians could take a rest in the benches, even if the main activity was still to walk along than to stand by (Fig. 3.24). This is the case of the 250 m long palm groove called 2 de Mayo Boulevard in the waterfront town Tingo (k) in Fig. 3.21, 3.25). It was built in 1903, with two rows of palms located in the middle of the street giving the place a "romantic atmosphere" (Pardo, 1963, 47)<sup>15</sup>. This pattern was used to visually accent a focal point (in this case a local market) at the end of the axis. The boulevard housed benches and an arbor where social activities were continuously held

#### b) The Undulating Tree-Lined Type

It shared many characteristics with the straight Type, except in its curved overall form. It can be interpreted as a negation of the rigidity of the colonial grid. It is the combination of the openness, individuality and freedom of modernity and, at the same time, a "modern nostalgia for the irregularities of the townscape" which once encouraged a "spirit of community" (Kostof, 1991)<sup>16</sup>.

One of the first organic promenades around the river area, was the San Lázaro Blvd, built besides a seasonal stream area as a tree-lined walkway in 1855 (b) in Fig. 3.23). As we mentioned before, San Lázaro used to be a segregated *reducción* during the colonial times. Thus, the boulevard integrated this



Fig 3.24. Street with trees in the middle allowed social contact. 3d of Tingo made by the author based on field survey.



Fig. 3.25. 2 de Mayo Palm Groove in Tingo, 1926.



area to the city's urban life. It will be discussed with more detail in chapter 5.

In the 20th century, the organic boulevard was used in new developments such as Selva Alegre (a) in Fig. 3.21) or Vallecito (h) in Fig. 3.21), where in 1926 the Peruvian Railroad company created a curved treed avenue (Martinez Blvd) to spatially connect the Parra Blvd to a promenade along the Chili River. This 700 m long and 16 m wide road joined the Melgar Park to the Polar Roundabout and the Malison Promenade located next to the river (Zeballos, 1979)<sup>17</sup> (Fig. 3.26, Fig. 3.27).

### (3.2) The River Promenade Type

#### a) Historical background

The Chili River in Arequipa forms a deep valley of steep rims, especially in the West riverbank. In some areas, the top of the rim is located over 25 m above the river level with a slope that rises until 80%. Because its difficult access, the riverfront areas were considered the back of the city in colonial times. However, due to its exceptional character as a viewpoint from where it is possible to have a panoramic scope of the riverscape, the valley, the city and the majestic volcanoes as a background; the population and the authorities started to gain interest in the riverfront at the beginning of the XIX century.

The construction of the Grau Bridge 1888 to facilitate the communication with Yanahuara and the expansion of the city to the North-West (Bedregal, 2001)<sup>18</sup>, raised the awareness of the population towards the riverscape, developing several promenades in the riverfront in the 20th century. The conception of the river as the main ecological axis in the development of the city was a fundamental issue in the Arequipa's first master plan by De Rivero in 1940 (De Rivero, 1940)<sup>19</sup>.

#### b) Physical-spatial configuration

The Riverfront Promenade Type was a border street, mostly located at the top of the rim, although eventually it could also be found at the bottom, right besides the river basin. One of the sides of the street was a built edge where the city ended, conformed by a row of houses. The other side was a promenade or a linear park open to the landscape overlooking the river, usually equipped with furniture to facilitate the gathering of the population and the enjoyment of the views.

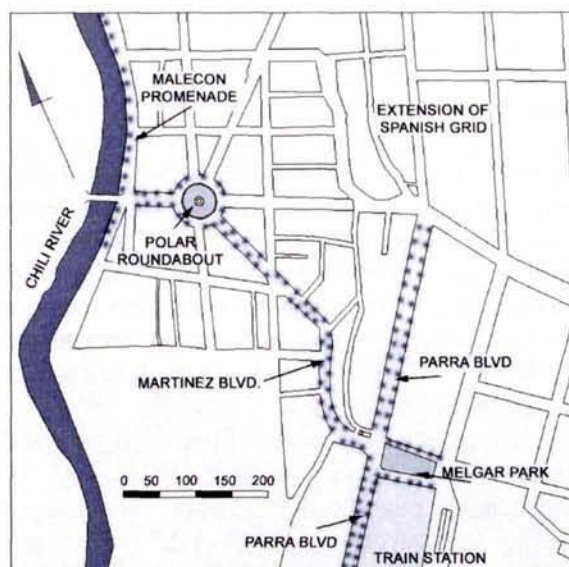


Fig 3.26. Spatial connection of Parra Blvd and the river.



Fig. 3.27. Perspective made by the author based on Zeballos Barrios and field survey.



The first riverfront walkway in Arequipa was the Paseo de la Alameda Promenade (**f**) in Fig. 3.21 Fig 3.28), built at the end of the 18th century by the quartermaster Álvarez y Jiménez under the auspices of the conservative Arequipan elite, concerned to provide the population with public spaces “to avoid leisure and bad entertainment practices” (Gutierrez, op cit). The promenade was a broad and paved street, located on top of the Western rim of the Chili, contiguous to the Old Bridge,

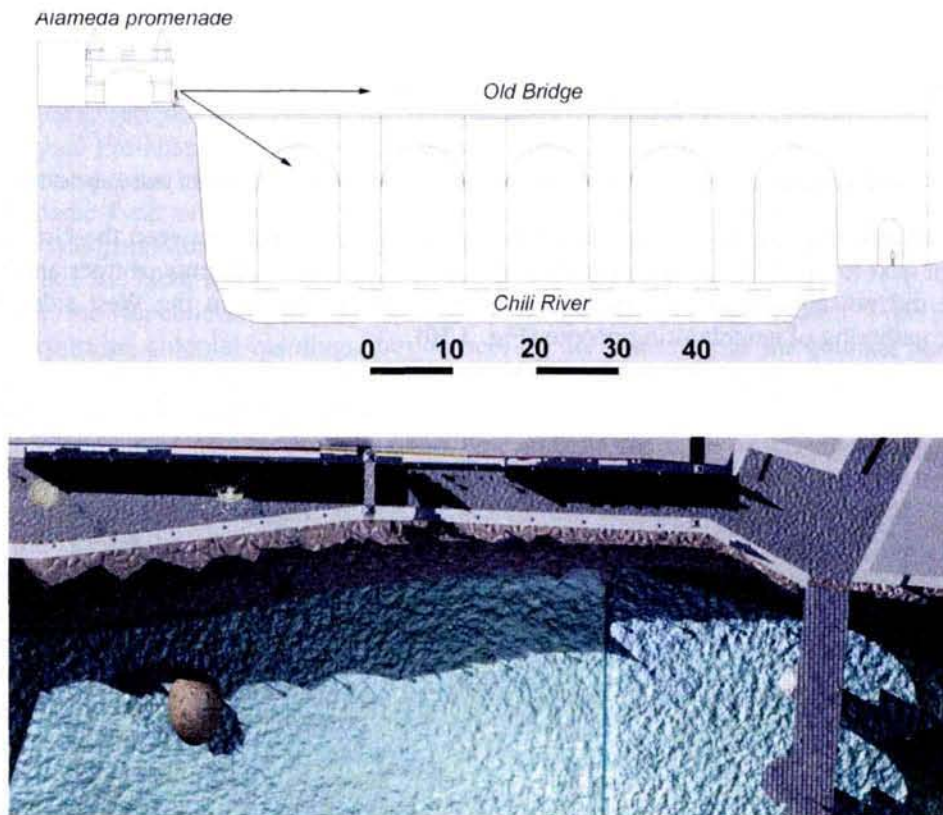
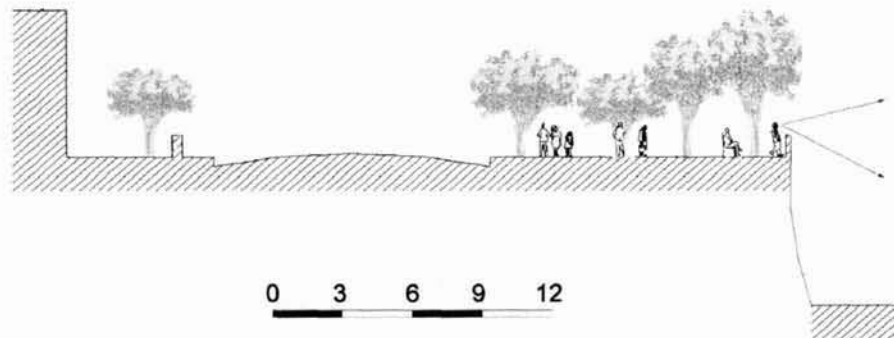


Fig 3.28. Cross-section and aerial view made by the author based on old pictures and Priest Blanco’s Diary

where “well-constructed houses with view points and balconies have been built” (Blanco, op cit.). The promenade had an extension of 300 varas (251.7 m) and a breadth of 30 varas (25.1 m). Its spatial characteristics will be further discussed in chapter 5

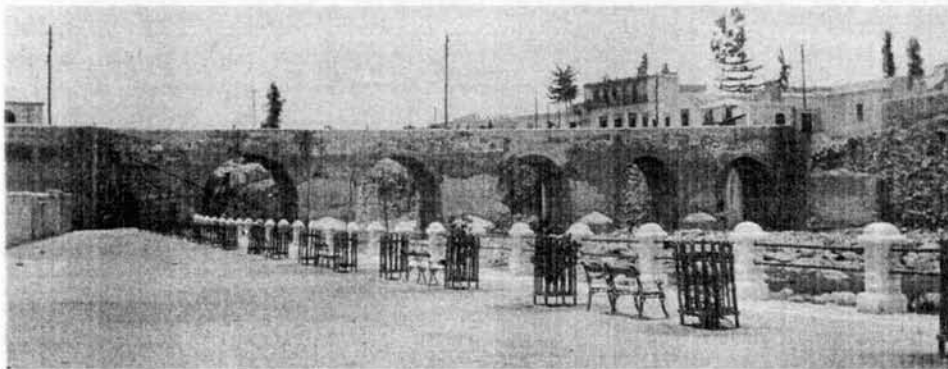
Another example of riverfront promenade is the Bolognesi Boulevard (**c**) in Fig. 3.21, Fig 3.29), the most important public space built in the 20th century specifically designed for the enjoyment of the riverscape. It was finished in 1910, and it extends 1.0 km along the river rim to connect the Grau Bridge with the popular Zemanath baths located in the Western riverbank. In one of the sides of the boulevard, garden type houses are located while in the other side, facing the riverfront, a linear park is placed, overlooking agricultural terraces and the river, which is located 15 m below. A more detailed explanation of its characteristics as an open space is offered in chapter 5.



**Fig 3.29.** Cross-section of the Bolognesi Boulevard, next to the riverfront, made by the author based on field survey

Another riverfront promenade was located in the Eastern riverbank, between the Grau and Old Bridge right next to the river. It was composed by a simple fence and an array of trees and benches. This space did not enjoy such impressive views as the ones located in the West side, but they favored the gathering of neighbouring people (**Fig. 3.30**).

### (3.3) Synopsis



**Fig. 3.30.** Riverfront promenade in the East river bank, constructed in the 1930s. Photo, Vargas, 1932.

The street types introduced in the expansion of Arequipa outside the central core after the 1868 marked a contrast with the ones located in the central area. They symbolized a new image of modernity in harmony with nature, and the spirit of a reborn city after the catastrophe. However, the urban planners avoided the temptation of build big boulevards upon the debris of the gridiron for the sake of modernity. Instead of that, they kept and rebuild their old city and protect their heritage, and choose to construct new developments with wider roads in the suburbs.

As a result, the city was composed of different quarters, characterized by typical streetscapes along which the observer could move.



### 3.4 SUMMARY.

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The 1868 earthquake was a breakpoint in the urban development of Arequipa; however, the reconstruction respected the city's heritage and urban layout. The urban expansion incorporated a new streetscape, undergoing a process of modernization while bringing the city nearer to its landscape resources. The findings of this study provide support to the hypothesis that from 1868 to 1940 Arequipa afforded the coexistence of several quarters with various street types (**Fig. 3.31**).

The unique streetscape of Arequipa was composed by the following street types:

- 1) The original Pre-Hispanic Type was the result of spontaneous and organic settlement, integrated into the landscape, but later secluded by the Spaniards due to functional and social reasons.
- 2) The Hispanic Type, on the other hand, was the result of an imposed gridiron model. However, the streetscape was conditioned by the seismic and climatic conditions of the environment, the use of local materials and labor force.
- 3) Similarly, the Republican Type consolidated the compactness of the Hispanic Type by adding a second story to the colonial buildings, but conserving the pattern from the colonial period. These street types expressed the characteristics of their society: spatially segregated, enclosed, homogeneous, compact and introverted.
- 4) The development of new landscaped street type and the approach of the city to the Chili River from 1870 to 1940 was an expression of the society's desire to build a modern city intimate with nature, a remarkable ideological change after the cultural isolation during the colonial times. The scale of the street space was enhanced by the new houses surrounded by gardens, but at the same time the individuality of the freestanding buildings contrasted with the previous homogeneity and continuity of the urban skyline. However, the trees in the streets made the urban horizon uniform and promoted social exchange among the passers-by.
- 5) The Riverfront promenade Type was a space for gathering, allowing a visual spatial connection with the riverscape and transforming the riverfront from the back of the city to the main space for recreation.

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<sup>8)</sup> Blanco, F.: Traveller diary, 1834. Copy from the Archive of History of Ecuador. *Denegri's personal Library*, Lima, 1952

<sup>13</sup> Alpaca, *Lama* parcos. South American mammal that lives in the highlands of the Andes. Its wool was very appreciated by the ancient Peruvians because of its quality and warm properties. The boom of the exportation of this wool from Peru to Europe, lead to the establishment of the trade companies in Arequipa, especially from England and France.

<sup>14</sup> According to the United States Geological Survey USGS Earthquake Hazards Program, the 1868 earthquake of magnitude approximately 9.0 was destructive and produced a tsunami that killed thousands of people along the South American coast, and caused damage in Hawaii and alarm in Japan. [http://neic.usgs.gov/neis/eq\\_depot/2001/eq\\_010623/](http://neic.usgs.gov/neis/eq_depot/2001/eq_010623/)

<sup>15</sup> Pardo, A. Arequipa, su pasado, presente y futuro. *Edited by Adela Pardo Gámez de Belaúnde*. P. 47. Lima, 1963

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**CHAPTER 4**

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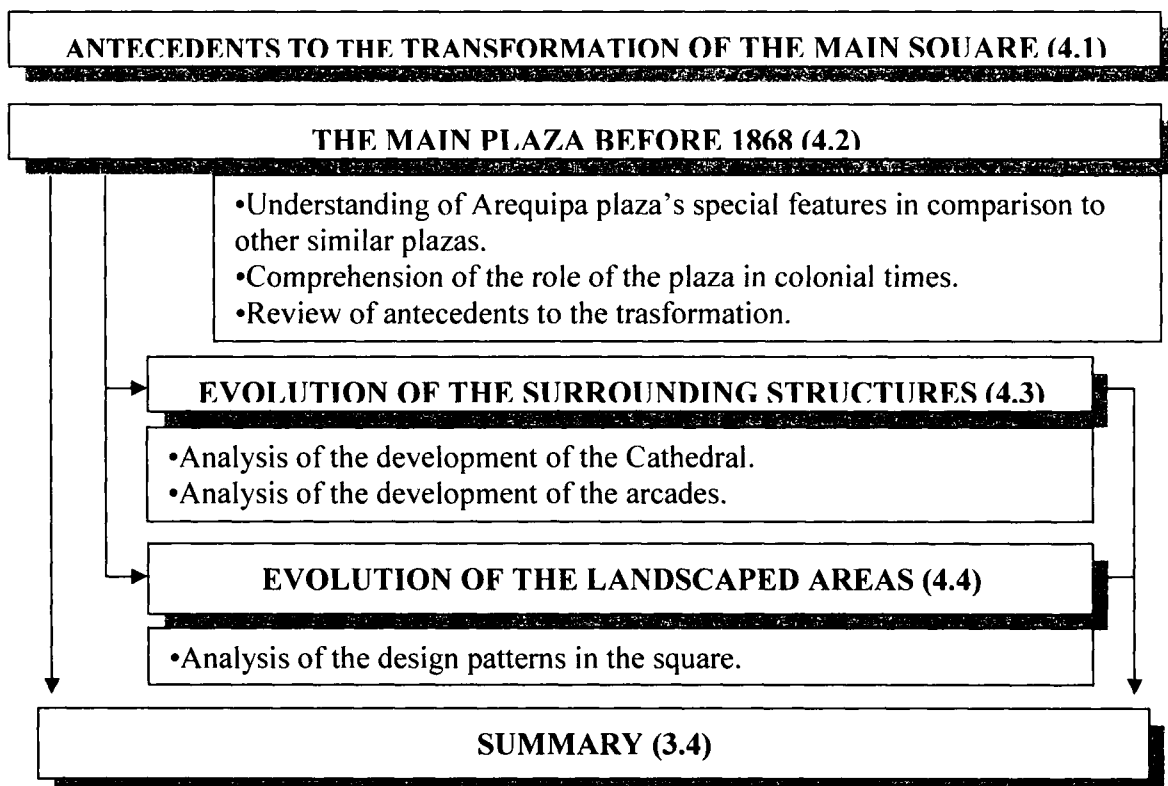
**DEVELOPMENT OF THE MAIN SQUARE AS AN URBAN  
CATALYST**

#### 4.1 ANTECEDENTS TO THE TRANSFORMATION OF THE MAIN SQUARE

As it was shown in the previous chapter 3 Arequipa was founded in 1540 by the Spaniards under an introverted model where the river was considered “the back of the city” and the riverbanks were known as “*La Barranca*” (the Cliff) (Carpio, 2005, pers. comm.; Palomino, 2004, pers. comm). The city was also centripetal (with the Main Square as the only public space in the city) and segregated (with differentiated areas for conquerors and native Indians). Eventually the churches surrendered areas for public use; nonetheless, before 1868 those spaces were basically utilized as open markets.

From this state, in which the city was detached from its riverscape and without recreational spaces, Arequipa was turned into a city with parks, promenades, treed streets and riverfront areas, without damaging its historical heritage. This upturn was carried out in only 50 years, despite the catastrophic effects of the 1868 earthquake, the Peru-Chile war (1879-83), the damage during the Chilean invasion of Arequipa (1883-84) and the economic bankruptcy during the post-war.

In this chapter, firstly we will discuss the main characteristics of the evolution of Arequipa’s Main Square and its surrounding buildings from its origin in colonial times to its conditions previous to the 1868 earthquake. Subsequently we will focus on the transformation of the plaza from 1868 to 1920. Later, we will explain the main characteristics acquired in the Main Square, which triggered a chain-reaction effect in other public spaces throughout the city.





## THE MAIN SQUARE BEFORE 1868

The Arequipa's Main Square or Plaza de Armas is important for its prominence in the spatial system, and its symbolic role in the tradition and history of the city.

### (1) Original layout characteristics

The Main Square, placed in the core of a grid layout, was a space for the celebration of the main religious, political, social, economic and civic activities in the city. It was also symbolically associated to the throne of God, following the ideas conceived by the monk Francisco Eximeniç and its ideal city. (Bielza de Ory, 2002).<sup>1</sup>

The following elements make the Arequipa's Main Square special, in comparison with other cities founded by the Spaniards in Peru and Latin America.

**a) The size.** The squares in Latin America are generally much larger than the ones in Europe, specifically in Spain. That can be explained because the Spanish territory was occupied previously by Moorish, who were not used to include squares in their cities. The experience of founding cities with large plazas in America was important for the urban planning in Spain in the XVIII century. In comparison, the Plaza de Armas in Arequipa was begun in 1540 and measures 135 m x 135 m. The Plaza Mayor in Madrid measures 129 x 94 m and was started in 1590<sup>2</sup>. The Plaza de la Corredera, the biggest square in Cordoba, was started in 1683 in a rectangular shape of 113 x 55<sup>3</sup> (**Fig 4.1**).



Arequipa, Peru



Cordoba, Spain



Madrid, Spain

**Fig 4.1.** Comparative sizes of the squares in Arequipa, Cordoba and Madrid

**b) The shape.** The geometry of the plaza is a perfect square of 110 m per side. The proportions of the plazas are in many cases irregular (Cusco, Peru), or rectangular (Spanish Laws of the Indies' regulations), producing a sensation of directionality or tension (Kostof, 1992, 136)<sup>4</sup>. The quadrangular shape in Arequipa, on the other hand, induces spatial equilibrium between the 4 sides of the plaza (**Fig 4.2**).

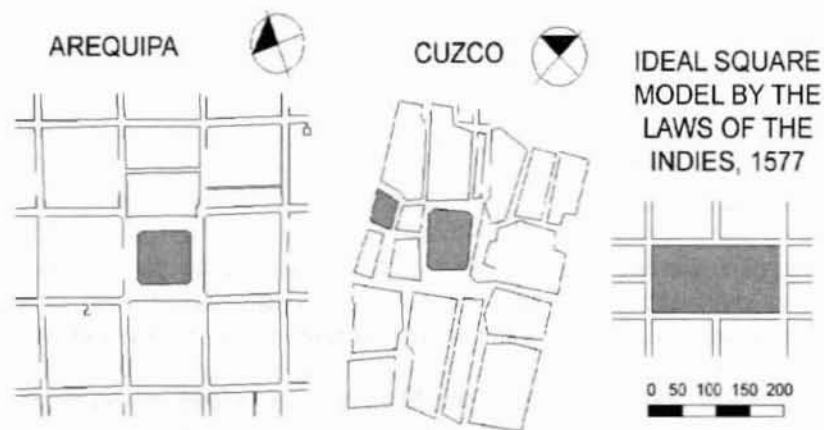


Fig 4.2. Comparative geometry of the main squares in Arequipa and other cities (Maps made by the author).

c) **The configuration of the surrounding blocks.** In Arequipa, the perimeter streets lead to the corners of the plaza, not to its center. In Cusco, Lima and many other cities, as well as in the regulations of the Laws of the Indies, streets lead to the middle of the square; therefore, the blocks are smaller. In Arequipa, the perimeter accesses allowed a longer continuity of the square's surrounding buildings (Fig. 4.3).

d) **The location of the main church,** which principal axis was parallel to the square. In most of cases (i.e. Cusco and Lima), the church's axis was perpendicular to the square because, according to the Christian tradition, it resembled a processional sequence from the entrance to the altar. In Arequipa, the church is located longitudinally and its long facade allows a better definition of the square and enhances the monumentality of the space (Fig 4.4).

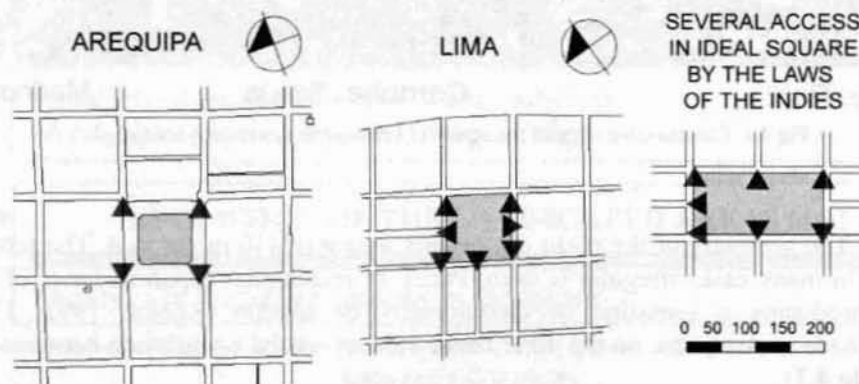


Fig 4.4. Comparative access of the main squares in Arequipa and other cities (Maps made by the author).

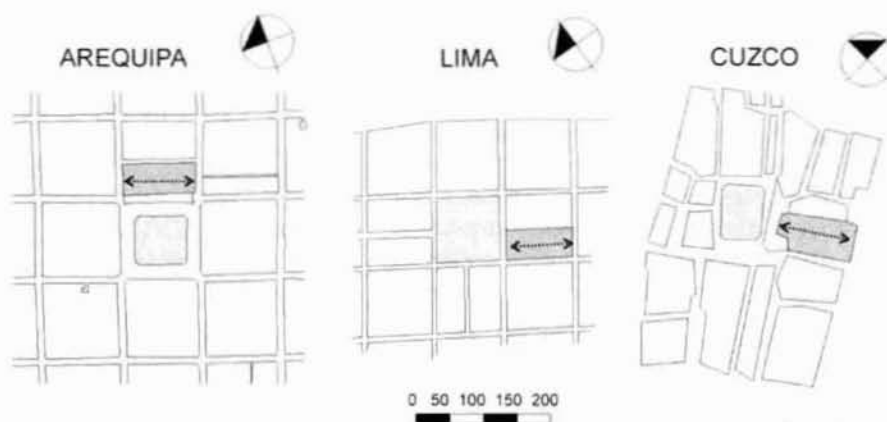


Fig 4.4. Comparative location of the main church with respect to the main square in Arequipa and other cities

## (2) Functional characteristics

In Arequipa and in Hispanic America in general, the square was not only a void area in a town, but the heart of the city, around where the main activities were centripetally structured. The Oxford English Dictionary defines “square” as an “open area in a town, usually with four sides, surrounded by buildings” and “plaza” as a “public outdoor square especially in a town where Spanish is spoken.” However the Royal Academy of Spanish Language’s Dictionary defines “plaza” as a “public, wide and spacious place in a town where the groceries are sold, where neighbors and traders treat and where the fairs, markets and public festivities are celebrated”.

The main functions that surrounded the square in Arequipa were the Cathedral or main church, the jail, the municipality and the house of the governor. The plaza was the place for social exchange, where people used to congregate to get water from its fountain. It was also the location for religious ceremonies, for the administration of justice or where the army used to form up (nowadays, the Main Square in Arequipa is still called “Plaza de Armas” or “Square of Weapons”)

However, the most important activity in the plaza was the commerce. The plaza was indeed the city’s open market (Fig 4.5a). The atrium of the Cathedral was even occupied by 36 small commercial kiosks commonly known as “cajoncitos” (little boxes), built by the Dominican priests in order to get some income for their rent, regardless the damage to the esthetical image of the monument (Carpio, 1983, III, 20)<sup>5</sup> (Fig 4.5b).

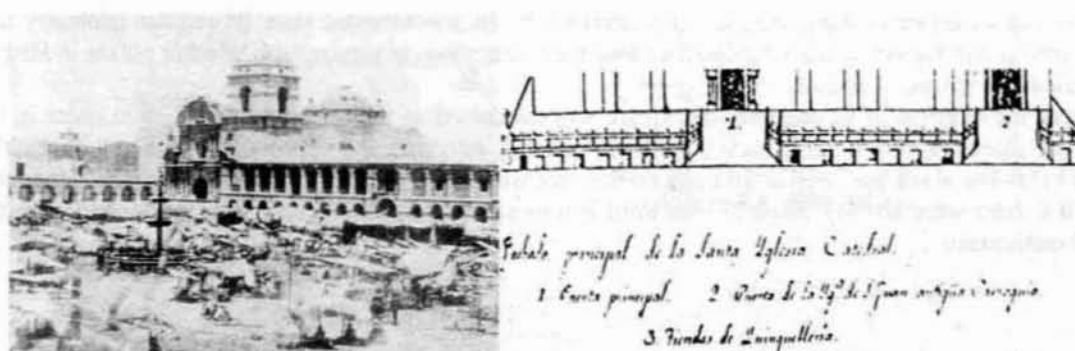


Fig 4.5 a) Main Square as an open market. View to the SE (Photo 1860 from Carpio).

b) Detail of the main facade of the Cathedral Church depicted in 1860. 1. Main access, 2. Entrance to the St. Juan. 4. Stores in the atrium.



### (3) Antecedents to the transformation

In the second half of the XIX century, the attitude of many prominent personalities in the political and academic circles was deeply influenced by the relationship existing between a scientific culture and a reformist trend for a modern society. That movement, known as Hygienism, was a combination of several disciplines which aimed the creation of a new society characterized by such notions as "clean", "healthy", "virtuous" and therefore of a new moral order.<sup>6</sup>

The influence of the Hygienism and landscape ideas brought to Arequipa by European non-Spanish merchants after the Peruvian independence (1821) triggered the desire of the local population to renovate the plaza as a space for recreation. As early as 1868 the municipal authorities decided to redesign the plaza from a market to a park and by April of that year the kiosks or "cajoncitos" in front of the Cathedral had been demolished to start the construction of the park (La Bolsa, Apr 8<sup>th</sup> 1868, p2). Unfortunately the 9.0 magnitude earthquake that devastated Arequipa in Aug 13<sup>th</sup> of the same year postponed the project of remodelling the plaza.

The 1868 earthquake destroyed the structures around the square, but the reconstruction that followed completely changed the perception of how the city's main public space should be. The concept of modernity associated to closeness to nature transformed the Main Square to a space to "see" and to "stay", rather than to "sell and buy". In the 20<sup>th</sup> century, new public needs appeared, like the use of electric street lighting, the automobile and the electric tram, while some of the functions in the square such as the jail or the house of the governor were relocated to other areas in the city.

### (4) Synopsis

The Main Square in Arequipa was characterized by its monumental size, its regular geometry and proportions and the continuity of its surrounding built structures, in comparison to other plazas in Hispan America and Spain.

From the moment of its creation, the square was conceived as the main and only public space in the city, the place where the main social, political, cultural, religious and especially commercial activities were held. The plaza was used as an open market, according to the custom in Hispan America. However, in 1868 there were already plans to transform it into a park, but those plans were postponed after the 1868 earthquake.



Fig. 4.6. Arequipa's Main Square, Cathedral and Chili River depicted during the eruption of the Huaynaputina Volcano, whose ashes covered the city on Feb.16<sup>th</sup> 1600. Drawing by Huamán Poma XVII century.



### 4.3 EVOLUTION OF THE SURROUNDING STRUCTURES

The Main Square is surrounded by the Cathedral in the north and three arched arcades in the east, west and south sides.

#### (1) The Cathedral

Arequipa's main church had experienced a dramatic evolution throughout its more than 460 years of history. At the beginning it was just a modest chapel, first built in 1544 by the bricklayer Pedro Godinez. The walls were made of white volcanic stone (*sillar*) and it was covered by a wooden roof (EGASA, 2005)<sup>7</sup>.

During the colony, various earthquakes damaged its structure and for that reason the temple was rebuilt several times, enhancing its size

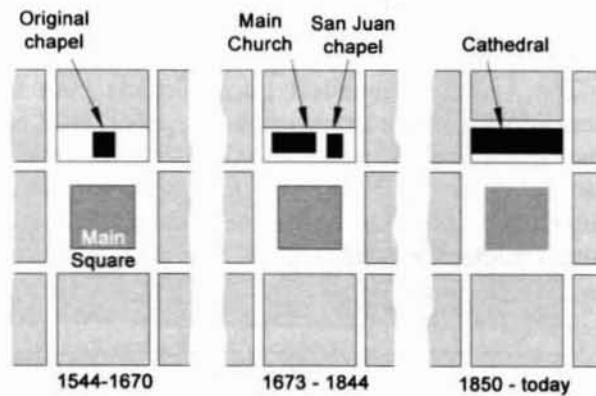


Fig. 4.7. Evolution of the cathedral's size with respect to the plaza

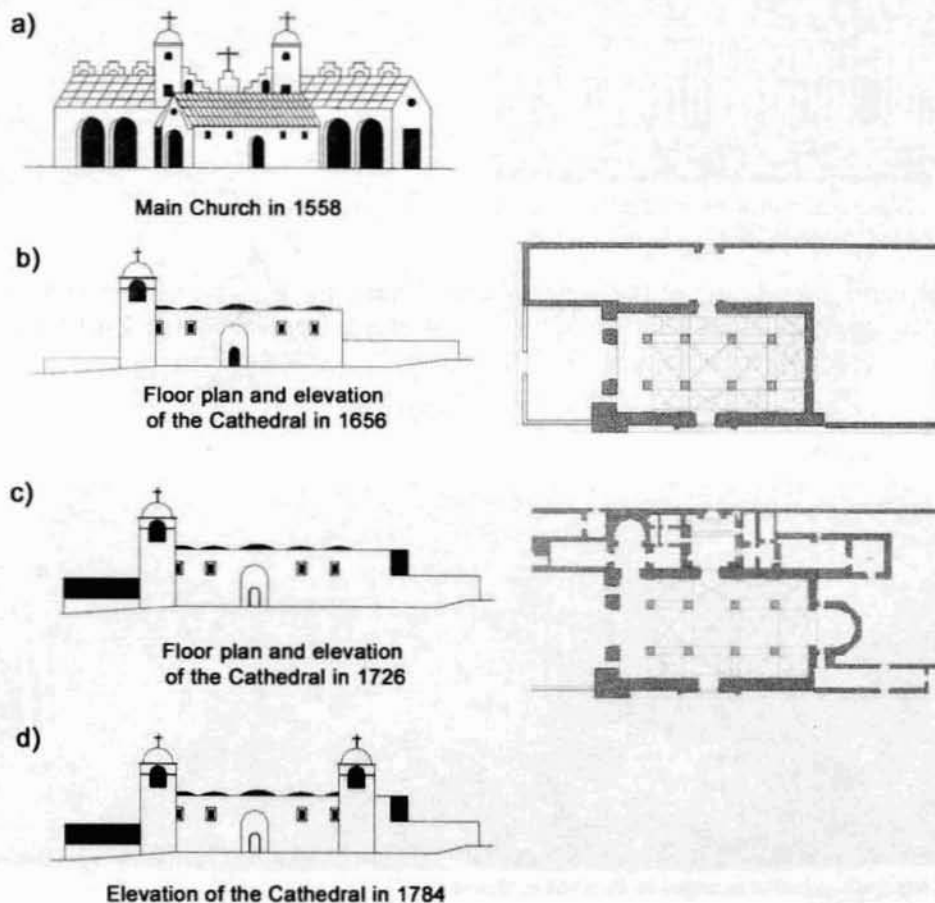


Fig. 4.8. Evolution of the Main Church according to Zúñiga

from a chapel to a church and improving its construction techniques (Zúñiga, 2004)<sup>8</sup> (Fig 4.7, 4.8). Its structure was partially damaged by earthquakes in 1606, 1666, 1668, 1687 y 1784<sup>9</sup>. By the 18<sup>th</sup> century the cathedral was 60 m long by 28 m wide; its structure was made of stone and its vaults of brick<sup>10</sup>. Next to it, the small San Juan chapel was located. In 1844 both churches were completely destroyed by a fire.

The Arequipan architect Lucas Poblete built the new cathedral in neoclassical style, and it occupied the whole extension of the block (107 m). In each side of the cathedral's atrium, "two magnificent arches" were located, finished in 1850 by Luis Gamo. These arches served as "support for the church and basically for decoration purposes".<sup>11</sup> According to several historians like Grandidier (1861), the Arequipan Cathedral was "the most remarkable monument built in Hispanic America after the independence"<sup>12</sup> (Fig 4.9).

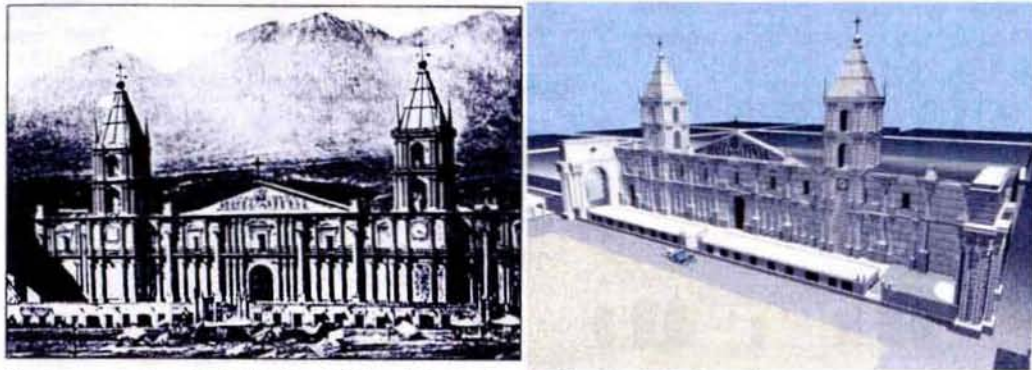


Fig. 4.9. a) Arequipa's cathedral before 1868 and the "cajoncitos" or kiosks in the atrium  
b) 3D model based on photographs and graphics

The 1868 earthquake destroyed the cathedral's towers and the large tympanum in the facade. It also produced several damages in its vaults, the sacristy and its lateral arches (Fig 4.10, Fig. 4.11).

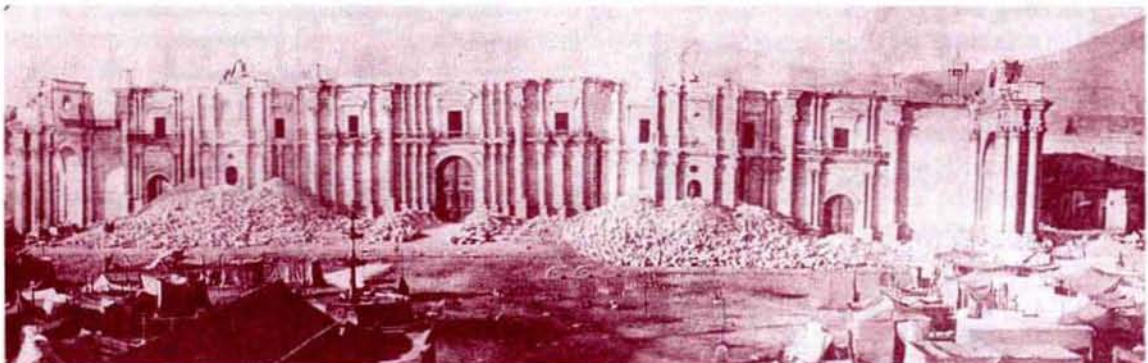
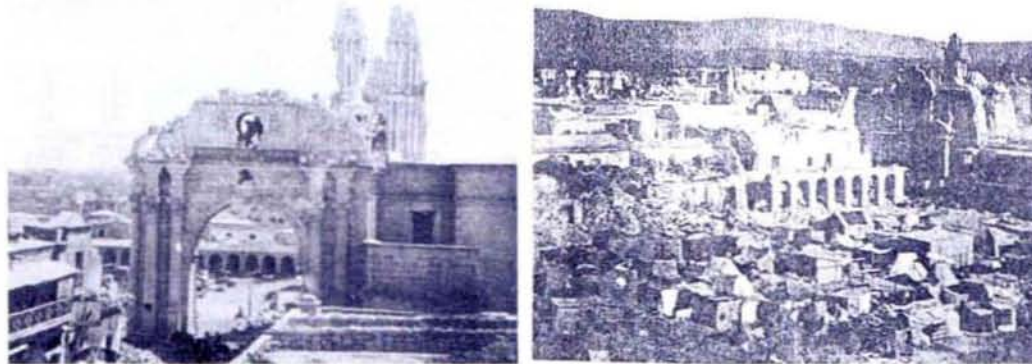


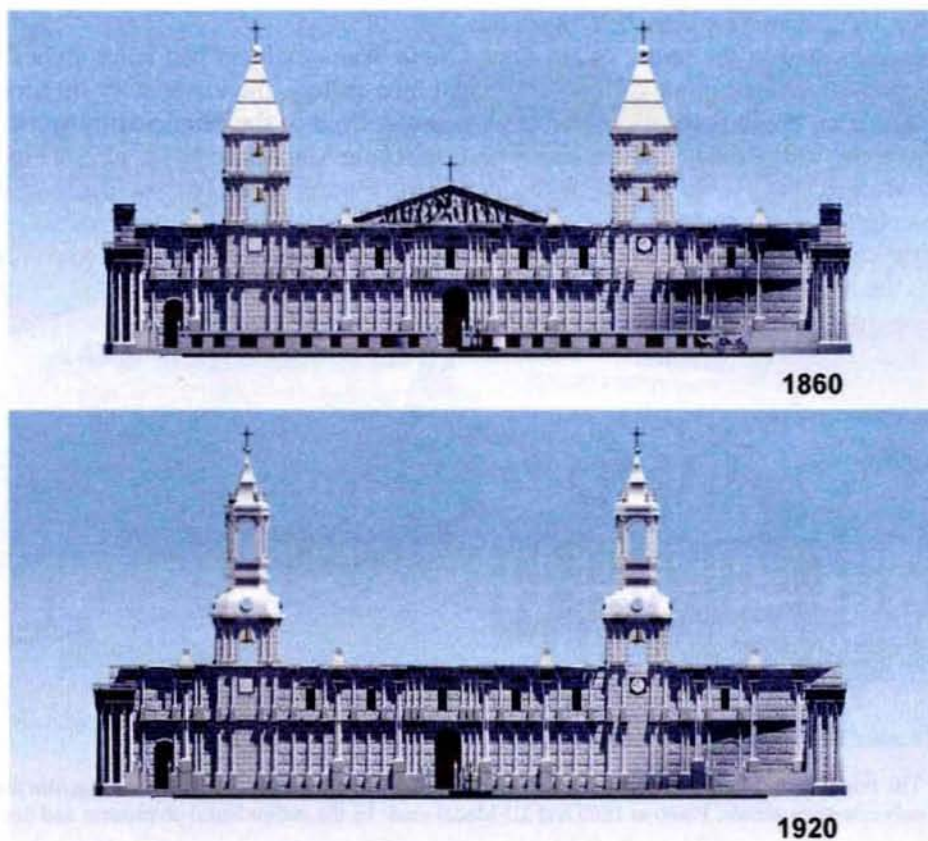
Fig. 4.10. Arequipa's cathedral damaged by the 1868 earthquake.





**Fig. 4.11.** Damages in the main square produced by the 1868 earthquake. Source: Carpio  
a) Cathedral towers and lateral arch.  
b) Arcades and La Compañía church

Lucas Poblete was the architect in charge of the reconstruction, who built the cathedral in Neo-Renaissance style. The new towers taller and slenderer, enhancing the scale of the building. The wide atrium, which previously had accommodated the kiosks, was designed by Lopez de Romaña as a spatial extension of the square (**Fig 4.12**).



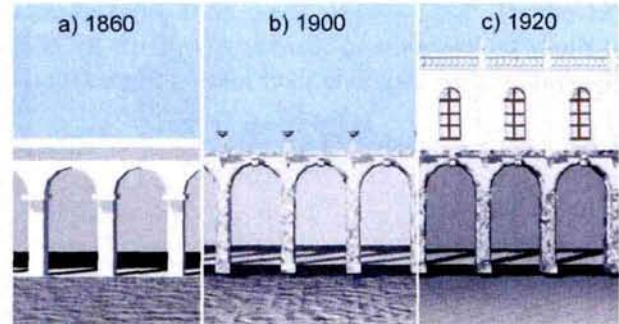
**Fig. 4.12.** Cathedral's facade in 1860 and 1920. 3D models made by the author based on photographs and field survey.



## (2) The arcades

Three arcades, located to the East, South and West, surround the Main Square and their main function was to provide protection from the rain or the sun. These arcades had received several names along history due to a particular characteristic (Carpio, 1983), but for practical reasons, we will refer to them as the names that are currently used: *Portal de Flores* (Flowers Arcade) to the East, *Portal de la Municipalidad* (City Hall Arcade) to the South and *Portal de San Agustín* (Saint Agustín Arcade) to the West.

The formal configuration of the arcades has evolved in 3 basic stages: (Fig 4.13).



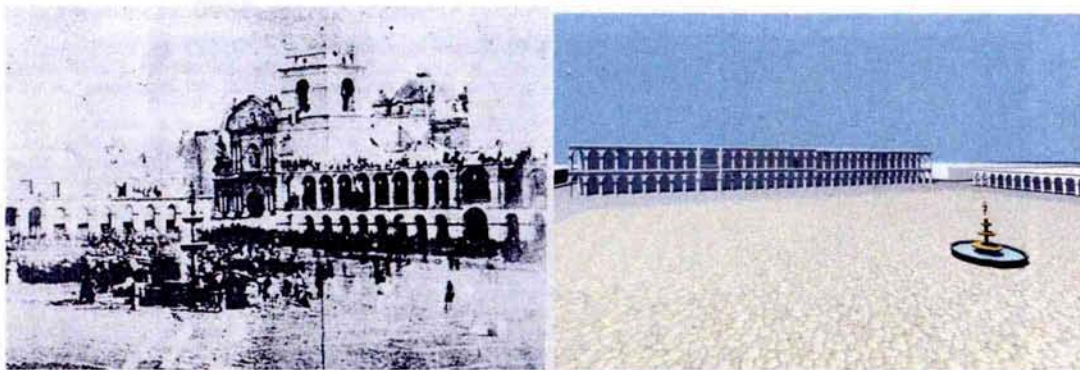
**Fig. 4.13.** Evolution of the surrounding arched arcades

- a) Two stories in the South arcade, one story in the east and west; irregular number and size
- b) One story, regular size and shape in all the sides
- c) Two stories, the second one is closed and crowned by a balustrade

### a) Before the 1868 earthquake

They were one-story arcades made of stone, built by private citizens (the owners of the stores in front of them), in order to use their rooftops, although their use at street level was given to the public (Gutierrez, 1992, p.94). Because of that, the arches did not follow a uniform pattern, and their shape, size and number were heterogeneous.

The arcade located in the south, called *Portal de la Municipalidad* had taller arches than in the rest of the plaza, arranged in a two-story white and blue gallery, the lower story of 5.5 m high and the upper one 5 m. high approx. Some arches located in front of the Municipality were even taller, to give hierarchy to the entrance of the City Hall (Escocia Magazine, N.12, p22). (Fig 4.14). The other two arcades, the *Portal de San Agustín* and the *Portal de Flores*, were one-story arcades, approximately 5 m high and also painted blue and white (Fig 4.13.a). The *Portal de San Agustín* had 39 arches and the *Portal de Flores* had 35, even if the distance that they covered was the same. Therefore, the arches in the *Portal de Flores* were bigger (Gutierrez, 1992, p.112)<sup>13</sup>. In the upper rooms there were galleries or balconies made of iron and wood.



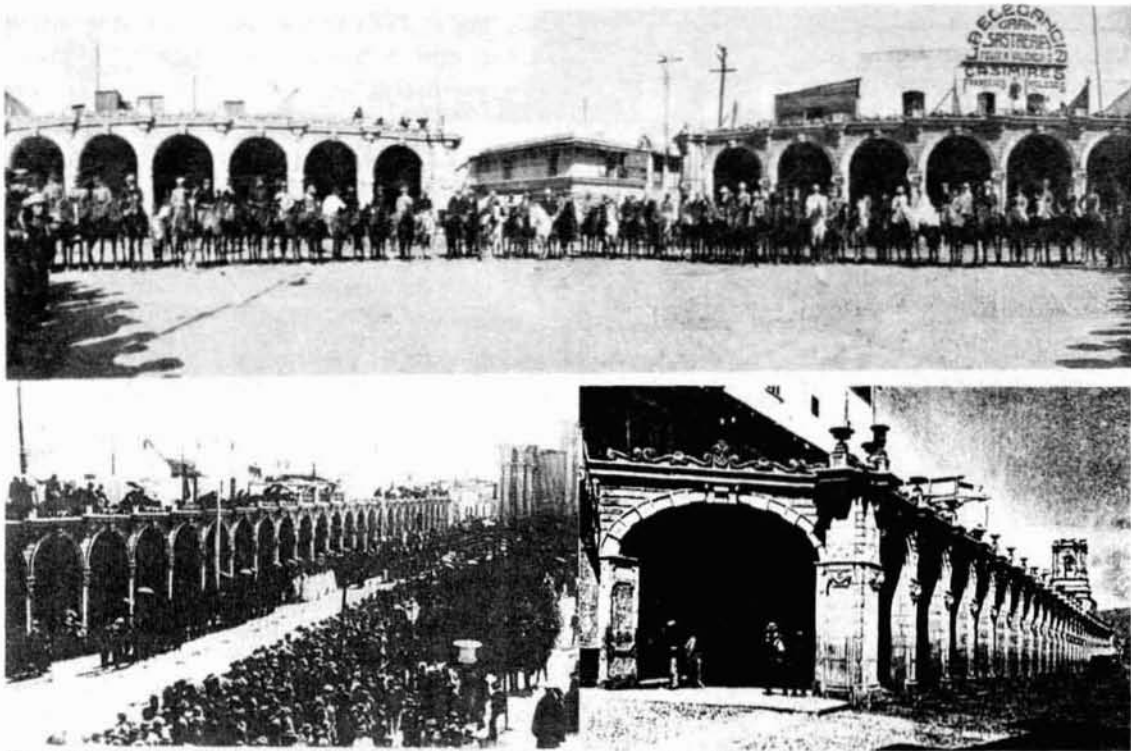
**Fig. 4.14.** The Portal de la Municipalidad had a two-story arcade, while the other Portal de San Agustín and Portal de Flores had only one-story arcade. Photo in 1860 and 3D Model made by the author based on pictures and documents.



**b) From 1869 to 1915**

After the earthquake and during the next 20 years the three arcades were rebuilt, under a project by Brugada with modifications by the engineer Augusto Tamayo and the participation of several Italian builders (i.e. Aquilino Cappeletti, Juan Albertozzi).

The three arcades were built in one story and their size and number was made uniform. Their design was also enriched, including neoclassical features, decorations and luminaries. The materials used were sienita rock, basanita from Misti volcano, pink *sillar* and bricks from Cañahuas.<sup>14</sup> (Fig 15, Fig 4.13.b)



**Fig. 4.15.** The arcades are made homogeneous in shape and number of arches.

- a) Portal de la Municipalidad (left) and Portal de San Agustín (right) during a civic-militar parade in 1910. Photo by Miguel de la Cuba.
- b) Portal de San Agustín in 1904, during the funeral of the President of the Republic, Mr. Candamo
- c) Detail of the corner of the arcades, which was chamfered. The design of the decoration presented with Neoclassical ornamentation

### c) From 1915 to 1960

In 1915 the authorities decided to embellish the square by enhancing its scale and adding a second story to the arcades. They considered that otherwise, the “culture of Arequipa will be diminished” (Gutierrez, 1992, 190).

Actually, the height of the one-story arcades looked too wide and flat in comparison with the breadth of the square, since they had a ratio of just 1:20 and a visual angle of  $3^\circ$ . When a second story was added in 1915, the ratio was increased to 1:10 and a visual angle of  $7^\circ$ . However, it still might look too wide for classic European standards <sup>15</sup> (Fig 4.16).

For the construction of the upper arcade, the authorities encouraged the owners of private stores located in the Main Square to build a second story, according to the official model (Romaña, 1916)<sup>16</sup>. The Italian architect Guidi designed the upper windowed galleries in Venetian style. In the upper part a neoclassical balustrade crowned the arcades. (Fig 4.13c, Fig. 4.17)

This design remained until the 1958 and 1960 earthquakes damaged the arcades, and they were rebuilt into its current form, which is open in the two stories.

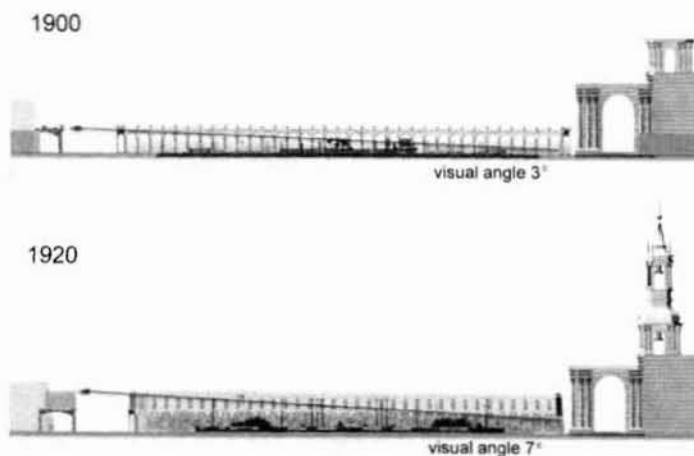


Fig. 4.16. Change in the visual angle in the plaza



Fig. 4.17. The 2 story arcades enhanced the scale of the square. The second floor was a windowed gallery, in Venetian style

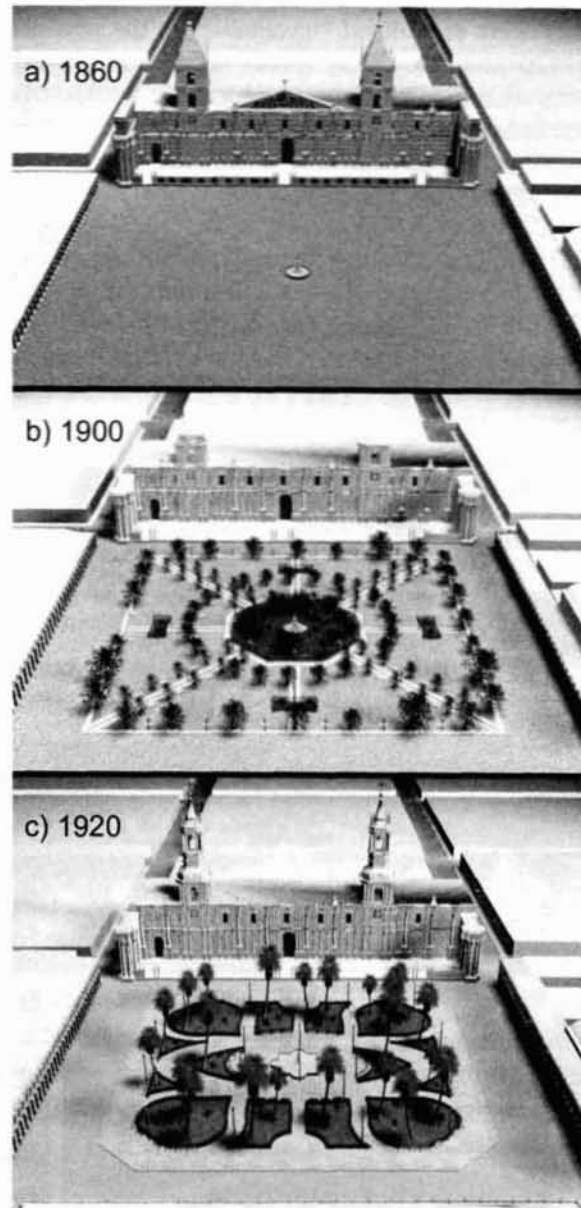
- a) The entrance to the city Hall used to be crowned by the national coat of arms
- b) The Main Square during a parade, showing its 2 story arcade

#### 4.4 EVOLUTION OF THE LANDSCAPED AREAS

The Main Square in 1540 was a 13,800 m<sup>2</sup> earthen area, with some scarce trees. In 1735 a three-section fountain was placed in the center of the plaza by the bishop Juan Caverio de Toledo, crowning it with a brass statue representing an angel playing a bugle, known as the "Tuturutu". (Fig. 4.18.a, Fig. 4.19.a,b)

The project of transformation of the plaza-market was initiated in 1875, when Francisco Pietrosanti changed it into a treed area, after a design by the mayor Lopez de Romaña (Zegarra, 1875)<sup>17</sup>. A road in the perimeter was defined and trees of various species framed the square. Treed diagonals of ficuses joined the corners with the center, a 20 m wide octagonal central garden around the fountain, and four lateral gardens, were located on the Cartesian axes. Iron fences protected all the gardens. The paving was made of pebbles and arranged in radial way, each line starting from the central point of the octagon. The benches and chandeliers were installed following the same arrangement. (Fig. 4.18.b, Fig. 4.19.c)

In the first decade of the XX this basic and rigid design was criticized by the mayor Octavio Muñoz Nájara, complaining about the shape and size of the sidewalks, the greenery and the "cemetery" trees, the fountain and the textures and materials of the floor (Muñoz, 1909)<sup>18</sup>. In 1908 the square was completely redesigned by the major Eleodoro del Prado, according to a scheme based on European models, which allowed a more casual stroll (Fig. 4.18.c, Fig. 4.19.d). Foreign gardeners such as Leopoldo Lucioni were hired to beautify the square (Carpio, 1983, IV, 220, personal comm. 2005). The paved stone, installed by Forga, was re-designed



**Fig 4.18.** 3D models of the evolution of the Main square:

- a) Without landscaped areas and the kiosks in front of the cathedral. The arcades are not uniform.
- b) Nuclear octagonal garden surrounding the fountain. Trees in the perimeter and crossing diagonally. Cathedral's atrium spatially linked to the square. The arcades are uniform.
- c) New cathedral is finished. The design of greenery is less geometric and allows casual strolls. Street lamps and vegetation are taller. Scale of the square is enhanced by adding a second floor in the arcades

using multicolor tiles. The quadrangular shape of the plaza was chamfered in the corners and a small grass rotunda replaced the big central garden with the fountain. The colonial fountain and the *Tuturutu* were considered “unsuitable” to the new aesthetic patterns and removed from the square until 1920 when they were finally re-placed in its original position. Greenery was introduced in 8 parterres with English grass, in which marble flowerpots laid, and the iron fences were replaced by bushes. Subsequently, trees and then palms were added to enhance the scale of the vegetation.



**Fig 4.19.** Photographic sequence of the evolution of the Main square:  
 a) and b) Main Square as an open market.  
 c) First landscape design of the square in 1900  
 d) Arrangement of the square's greenery in 1920.



## 4.5 SUMMARY

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The spatial characteristics of Arequipa's plaza, its size, geometry, spatial continuity and the orientation of the main church, contributed to the definition of a clearly defined space, very regular in comparison to other squares built in that time in Latin America. Arequipa's Main Square was conceived as the central public space in the city, surrounded by the main religious, political and judicial activities. However, the main activity that was held in the square was the commercial one, since the space was used mainly as an open market.

The transformation of the Main Square in Arequipa from a plaza-market to a plaza-park (1868 – 1920) was an expression of the evolution of the local population's approach to nature and landscape. The reconstruction of the square, the cathedral and the surrounding structures after the 1868 earthquake was an opportunity to renovate the plaza and to enhance its character as a recreational space. Thus, the Main Square became the space for the innovation of urban landscape design ideas.

The design of both the cathedral and the arcades was influenced by the neoclassical style and they were the result of mutual collaboration between European and local architects and craftsmen.

The landscape design in the square evolved from a very geometrical radial scheme to a more organic layout that favored the stroll of the passers-by.

The consolidation of the square's spatial structural coherence, the enhancement of its monumentality and scale and the inclusion of new recreational activities in addition to its previous socio-cultural-civic role produced a chain-reaction effect in other spaces in the city, as it will be clarified in the following chapter.

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- 
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  - <sup>2</sup> Wikipedia. Plaza Mayor de Madrid. [http://es.wikipedia.org/wiki/Plaza\\_Mayor\\_de\\_Madrid](http://es.wikipedia.org/wiki/Plaza_Mayor_de_Madrid)
  - <sup>3</sup> Wikipedia. Plaza de la Corredera. [http://es.wikipedia.org/wiki/Plaza\\_de\\_la\\_Corredera](http://es.wikipedia.org/wiki/Plaza_de_la_Corredera)
  - <sup>4</sup> Kostof, S. The City Assembled: The Elements Of Urban Form Through History. *Thames & Hudson*. 1999.
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  - <sup>6</sup> Ariodante Fabretti Foundation. *Morte, cremazione, igiene e società nel XIX secolo*. Turin . 2004. <http://www.arpn.net.it/fabretti/inglese/morte4th2004.html>
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  - <sup>8</sup> Zúñiga Alfaro, A. Proceso histórico.intervenciones y estilo de la Catedral in Info CAP, Marzo-Abril. 2004. p. 10-13 *Colegio de Arquitectos del Perú JRA*. Arequipa, 2004
  - <sup>9</sup> AQPLINK. Impotancia de la Catedral de Arequipa. p4. <http://www.aqplink.com/catedral/paginas/pontemarco04.html>
  - <sup>10</sup> A cathedral is a Christian church building, specifically of a denomination with an episcopal hierarchy, which serves as the central church of a diocese, and thus as a bishop's seat. Arequipa's main church became a Cathedral from 1609.
  - <sup>11</sup> Archivo Arzobispal De Arequipa. *Note from the Ecclesiastical Chapter*, 13 April, 1836
  - <sup>12</sup> Grandidier, E. *Voyage dans le Amerique del Sud. Perou ed Bolivie*. Paris, 1861
  - <sup>13</sup> Gutiérrez, R.: *Evolución Histórica de Arequipa*. Epigrafe Editores, pp 80-225. Lima 1992
  - <sup>14</sup> Poncingon, E. Album Mundial del Sur del Perú.. Article "Los portales de la Plaza de Armas de Arequipa". Lima, 1928

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<sup>15</sup> Leon Battista Alberti in his Ten books of architecture (1755) writes "A proper height for the buildings about a square is one third of the breadth of the open area, or one sixth at the least" (De re aedificatoria . viii.6, mentioned by Spiro Kostoff, the city assembled, 137)

<sup>16</sup> Romaña, M. Memoria presentada al H. Concejo Provincial por el Alcalde Modesto de Romaña. Año 1914. *Tipografía Quiroz Perea*. Arequipa, 1916

<sup>17</sup> Zegarra, M. Memoria del Alcalde al Honorable Concejo de Arequipa. *Printed by Ibañez*. Arequipa, 1875.

<sup>18</sup> Muñoz, O. Memoria presentada al Honorable concejo Provincial por el Alcalde Modesto de Romaña. Año 1908. *Tipografía Quiroz Perea*. Arequipa, 1909

## **CHAPTER 5**

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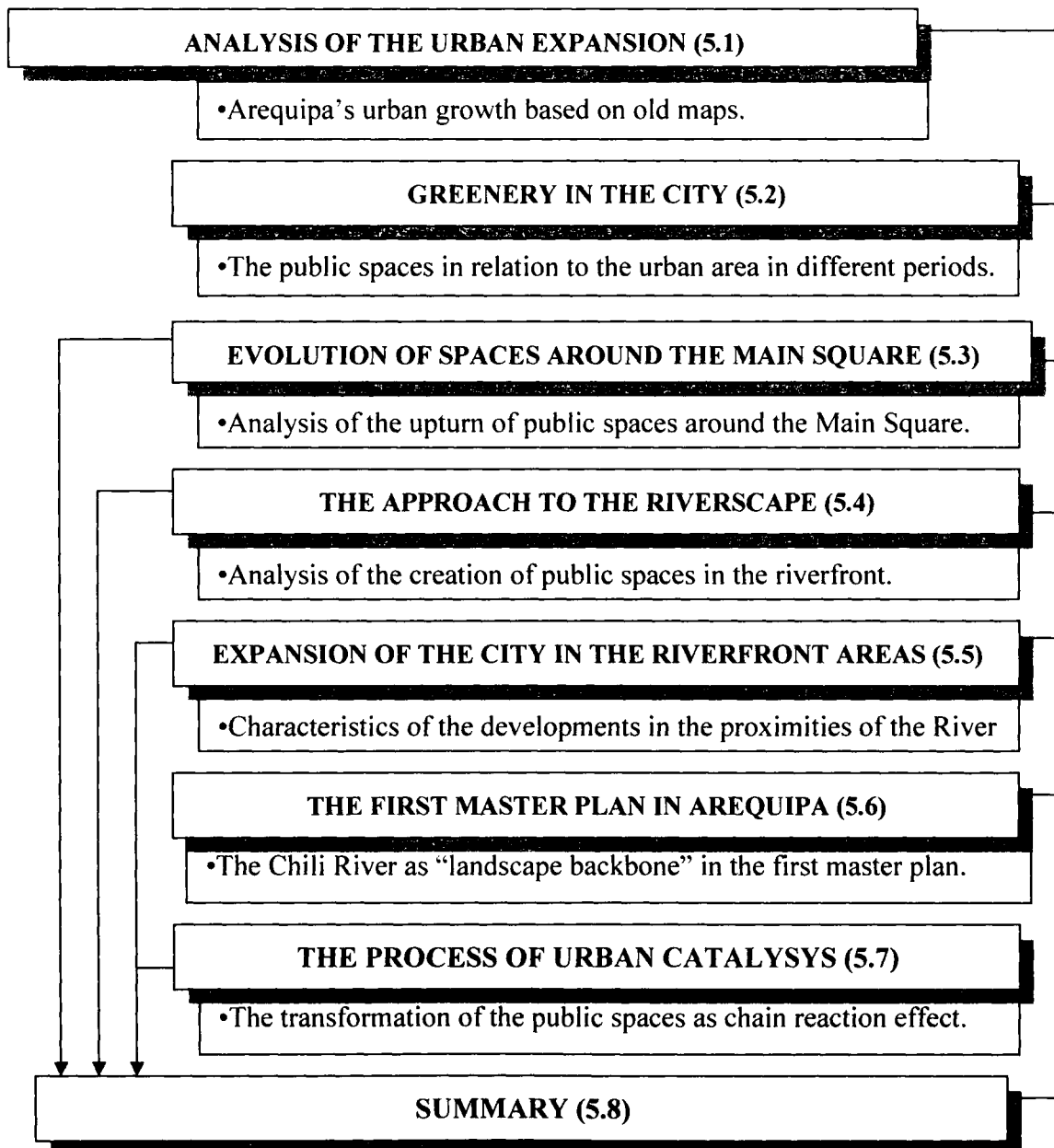
# **DEVELOPMENT OF THE AREQUIPA'S LANDSCAPE FROM THE MAIN SQUARE**

The influence of the Hygienism and landscape ideas brought to Arequipa by European non-Spanish merchants triggered the desire of the local population to renovate the plaza as a space for recreation.

As a consequence, we proposed that the following process was carried out:

- a) An urban catalytic process took place, favoured by the transformation of the Main Square, which triggered the upturn of other public spaces.
- b) In this process the public spaces influenced each other and formed an urban spatial system, developing a particular character and incorporating the riverscape as a recreational area for the city.
- c) The population built a new imageability of the city associating the concept of modernity to the respect of its riverscape and closeness to nature.

5





## 5.1 URBAN EXPANSION

### (1) Purpose

The analysis of the characteristics and evolution of the urban fabric it is important to understand the factors that triggered the expansion of the city.

Our goal is to determine the breakpoint in the evolution of the city, and when the facilities that motivated tendencies of urban growth from 1540 to 1940. By understanding the process of urban development, it will be possible to clarify the frequency, direction and pattern in which the city has grown throughout time.

### (2) Method

In order to determine the process of urban expansion, old maps from different époques will be superimposed using GIS techniques, obtaining a comparative sequence of the urban development (Fig. 5.1). There is no original map from the foundation of the city; therefore, we will rely on the description in the foundational act document. The maps from 1784, 1835, 1865 and 1905 are not geographically accurate and they use different scales and orientations; therefore, they will be retraced in AutoCAD prior to the analysis in GIS. The maps made in 1917 and 1940 are much more accurate and they fit with a geo-referenced map of Arequipa made in 2000. The spatial analysis will be complemented with basic statistical analysis of the urban expansion

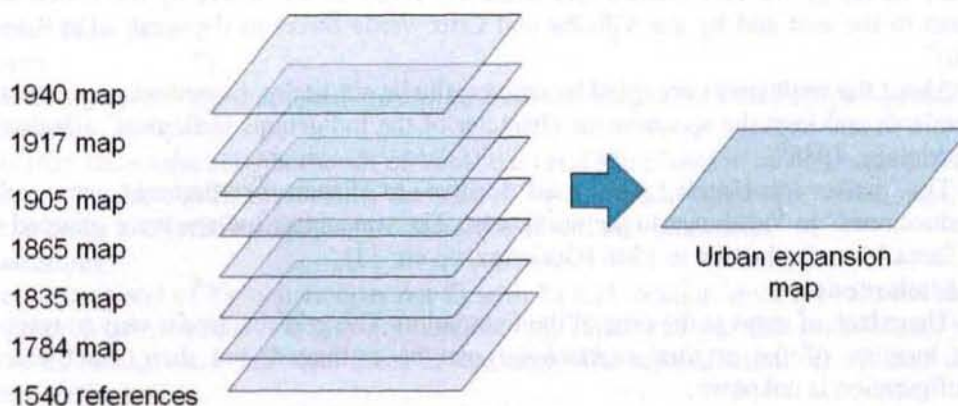


Fig. 5.1. General scheme of the urban expansion GIS analysis.

### (3) Sources

As it was previously mentioned, there are no maps of the Arequipa prior to 1784 and the first geographically accurate map was only made in 1917 by De Rivero. However, it was possible to trace the expansion of the city taking the act of foundation and the studies of other researchers as a reference. The available maps have been reproduced in the Appendix section.

Each one of the sources, a general description, its limitations and accuracy will be explained in the following.

**a. Pre Hispanic Period (Before 1540)**

**1) Source**

There are no maps of the pre – Hispanic settlements. The work of Galdos (1985)<sup>1</sup> describes the location and general arrangement of the pre Hispanic communities of Arequipa.

**2) Description**

Most of pre Hispanic settlements were scattered and dispersed throughout the agricultural fields. Galdos and Gutierrez (1992)<sup>2</sup> provided descriptions about the character of the streetscape and the organic spatial arrangement of the area know as San Lazaro, which was the most developed area before the Spanish occupation.

**3) Limitations**

There are neither exact records nor maps of that époque. The location of San Lazaro is known, but not its extension.

**4) Accuracy**

Low.

**b. Colonial Foundation (1540)**

**1) Source**

Gutierrez (op cit) and De Rivero (1940) described the extension of Arequipa at the moment of its foundation.

**2) Description**

De Rivero describes the limits of the city “by the current Ayacucho and Puente Grau Street to the north, by the San Camilo and Consuelo Street to the south, by the Colon and Pizarro Street to the east and by the Villalba and Cruz Verde Street to the west” (De Rivero, op cit, 130)<sup>3</sup>.

About the settlements occupied by natives, the layout in San Lazaro was not “retraced by the Spaniards and kept the spontaneous character of the indigenous settlement” (Gutierrez, op cit, 28, Malaga, 1988<sup>4</sup>).

The native inhabitants, who used to live in disperse settlements were relocated in “reducciones” in Yanahuara to the north west. The *yanaconas* Indians were grouped in the area of Santa Marta to the east in 1546 (Gutierrez, op cit, 33).

**3) Limitations**

There lack of maps at the time of the foundation. The gridiron area is easy to reconstruct, but the location of the original *reducciones* can be estimated, but their exact extension and configuration is unknown.

**4) Accuracy**

Medium-Low.

**c. Colonial Time (1784)**

**1) Source**

1784 map by Alvarez & Jimenez (See Appendix 1).

**2) Description**

This map shows the extension of the city towards the south, occupying one complete row of blocks, expanding even to the limit of a water channel. To the west, the expansion towards the Chili River is not homogeneous, basically concentrated around the bridge. To the north, the gridiron is integrated to San Lazaro, whose limit is the torrent stream. The expansion to the west did not follow a regular pattern, influenced by the native settlement of Santa Marta. On the

other bank of the river, there is an incipient development around a road which connects the bridge with the neighborhood of Yanahuara. The reduction of Yanahuara was traced using a smaller gridiron pattern than in Arequipa, but this layout was not respected and the maps shows a partial consolidation of the grid model.

**3) Limitations**

The proportion and dimensions of the blocks are not exact, but the exact location of the elements represented can be estimated from their current situation.

**4) Accuracy**

Medium-High.

**d. Republic Time (1835)**

**1) Source**

1835 map by Diego Rodriguez dedicated to Jose Sebastian de Goyeneche y Barreda (See Appendix 2).

**2) Description**

This map shows little difference in comparison to the 1784. The southernmost area looks more consolidated, the same as the area of Miraflores.

**3) Limitations**

The proportion and dimensions of the blocks lack precision, but it is possible to determine the location of its components.

**4) Accuracy**

Medium-High.

**e. Republic Time (1865)**

**1) Source**

1865 topographic map published in Paris by Mariano Felipe Paz Soldán (See Appendix 3).

**2) Description**

This map shows the neighborhoods of Yanahuara and Miraflores much more consolidated. It also presents some expansion towards the west along the roads to the east, and it depicts with detail the shape and location of the agricultural fields and the rural roads.

**3) Limitations**

The location and of Yanahuara does not fit with its real location since it is located too close to the gridiron of Arequipa. It is also not possible that Yanahuara was that consolidated because many of its blocks were still rural areas at that time. The area of Miraflores is also depicted deformed to the east.

**4) Accuracy**

Medium.

**f. 1905**

**1) Source**

1905 map depicting the pipes that supply water, made by M. Maldonado. (See Appendix 4).

**2) Description**

The Grau Bridge is depicted for the first time in a map. It shows the expansion of the city towards the south with the road to Tingo and the "Sagrados Corazones" School (Colegio de los SS Corazones). The expansion to the east follows the rural roads and Miraflores appears like a separated town. It also shows other facilities like the slaughter house (camal) and the baths (banos) near the river. There is a small expansion to the north, near to the San Lazaro church.

The map also shows the kind of vegetation planted in the farms and even the direction of the land's furrows.

**3) Limitations**

Again, the proportion and orientation of the blocks outside the central core differs from the real one. The map lacks information on Yanahuara, and the railroad station was not depicted.

**4) Accuracy**

Medium.

**g. 1917**

**1) Source**

1917 map by Alberto de Rivero. (See Appendix 5)

**2) Description**

It shows the expansion to the south, the Parra Avenue and the train station. To the northeast, it depicts the zone of Yanahuara, the Zemanath baths and the Bolognesi Boulevard under construction (at that time called Jorge Chavez). To the northeast, it shows Miraflores as a separated town, but soon to be linked to the rest of the city. The Goyeneche Hospital leads the expansion to the west.

**3) Limitations**

It is a much more accurate map and its proportions and distances are more reliable.

**4) Accuracy**

High

**h. 1940**

**1) Source**

1940 map by De Rivero. (See Appendix 6)

**2) Description**

It shows the expansion to the south, with Vallecito and to the North with Selva Alegre. Also, it is remarkable the consolidation of Yanahuara and the creation of the structural access to the west. The expansion to the east is strong as well as the connection to Miraflores. The planned expansion of the city is depicted in white blocks.

**3) Limitations**

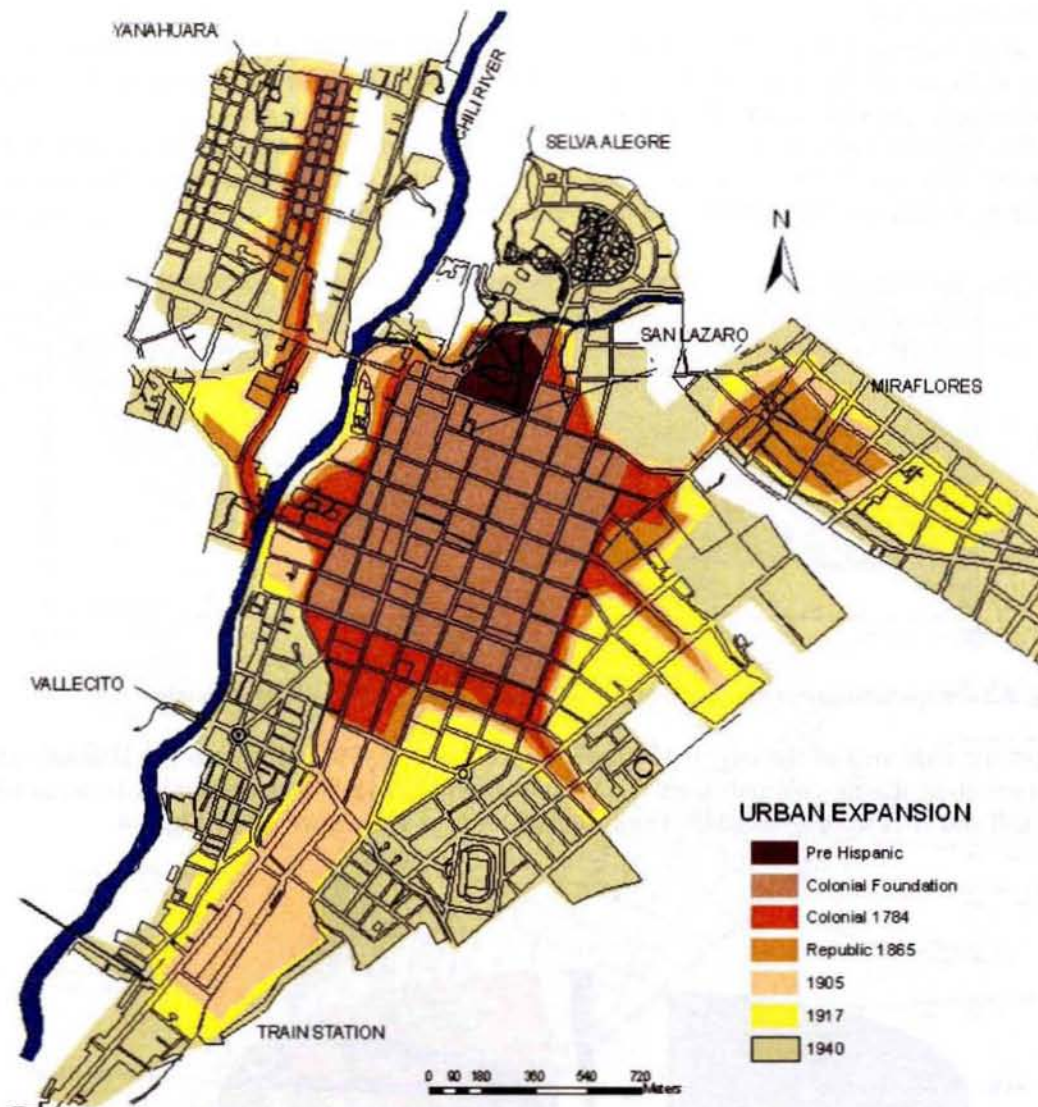
Highly reliable.

**4) Accuracy**

High.



#### (4) Spatial Analysis



**Fig. 5.2.** Urban expansion of Arequipa. Map made by the author based on the maps included in the Appendix.

As it can be seen in **Fig. 5.2**, after the colonial foundation the city experienced a slow development. In 1784 it grew from 83 hectares to 120 hectares, which is less than 40 hectares in 245 years. There is a relative expansion to the south and to the road leading to Yanahuara.

In 1865, 80 years later, the city had not changed much, growing to 157 ha, basically to the northeast and along the rural roads.

The urban sprawl started to become more expansive after the 1868 earthquake. By 1917 the city had grown to 281 ha, mostly to the south, where the train station was located. It is clear how the presence of the railroad promote the urban development in this sector. But it is also clear an expansion in the north, near the riverfront, due to the construction of the new bridge and the Bolognesi Boulevard.

By 1940 the city had grown up to 530 has, the largest expansion phenomenon up to that date. The city expanded to the east with Selva Alegre, to the Northwest with Yanahuara, to the Northeast with Miraflores and to the south with Vallecito.

In the following graphic it can be observed the comparative expansion of the city and the breakpoint after the 1868 earthquake due to the policies that favored urban expansion for considering it safer than the construction in several stories (Fig. 5.3).

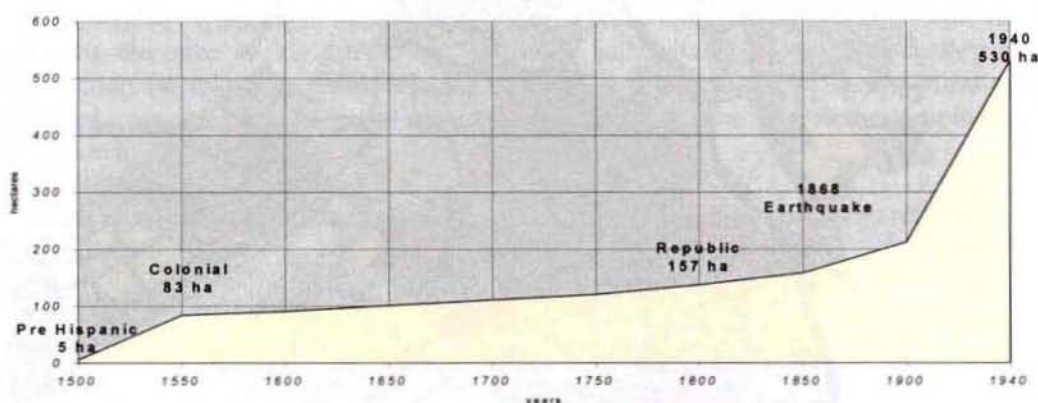


Fig. 5.3 Comparative urban expansion of Arequipa until 1940. Chart made by the author.

From the total area of the city in 1940, the 1% corresponded to indigenous pre Hispanic areas, 22% were areas during colonial times (Foundational and 1784), 7% corresponded to areas added until 1868 and 70% were areas added from 1868 to 1940, as it is shown in the Fig. 5.4

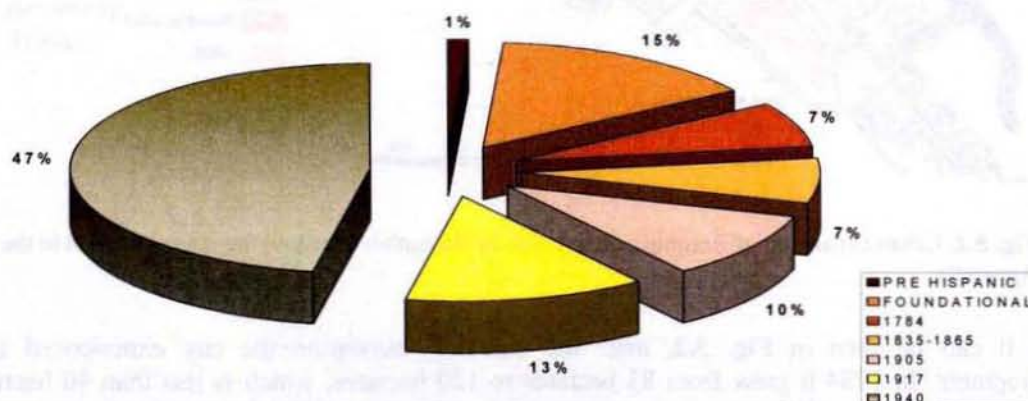


Fig. 5.4 Percentage of urban expansion in Arequipa until 1940. Chart made by the author.





### (3) Method

First, we will determine the area of study by creating a buffer from the Chili River. According to the American Road Engineering Journal, the average speed of a walking person is 4.1 feet per second (1.23 m/sec). The area of influence of the river is defined by the distance that a pedestrian takes in 8 minutes walk from the river, or 590 meters (PEGUP, op cit, 23). Closer distances of 2 minutes walk (147.6 meters) and 5 minutes walk (369 meters) have been also considered as a secondary reference. (Fig. 5.6).

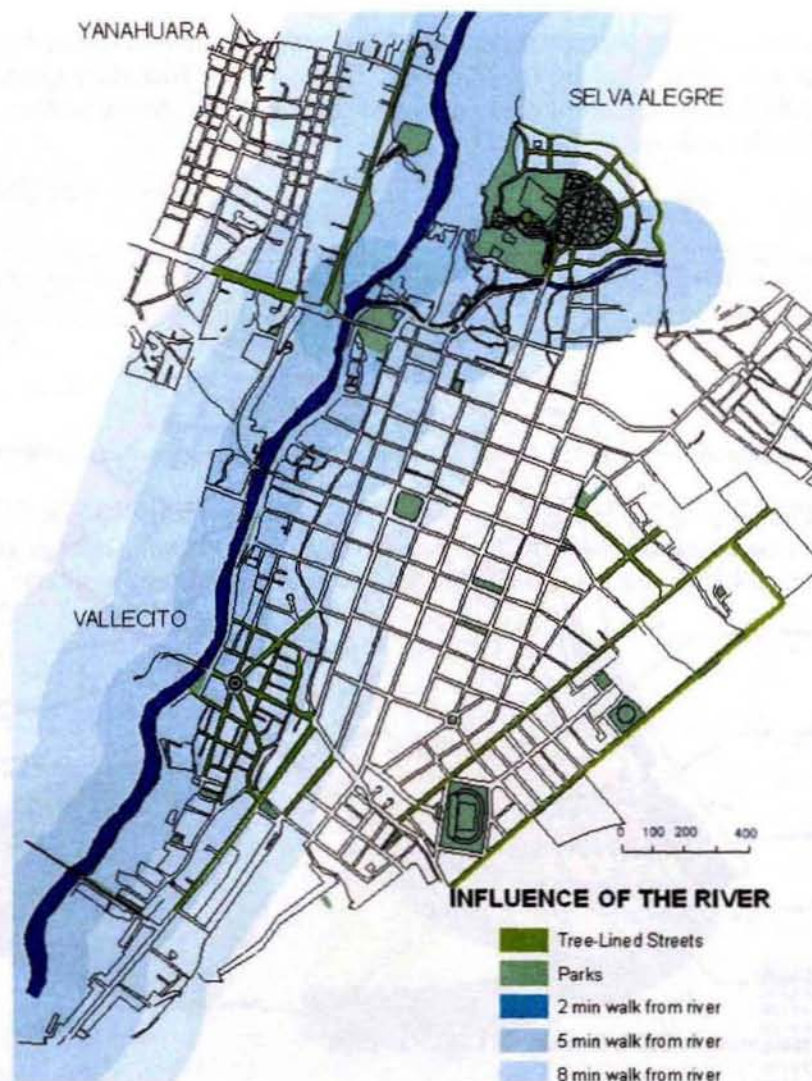
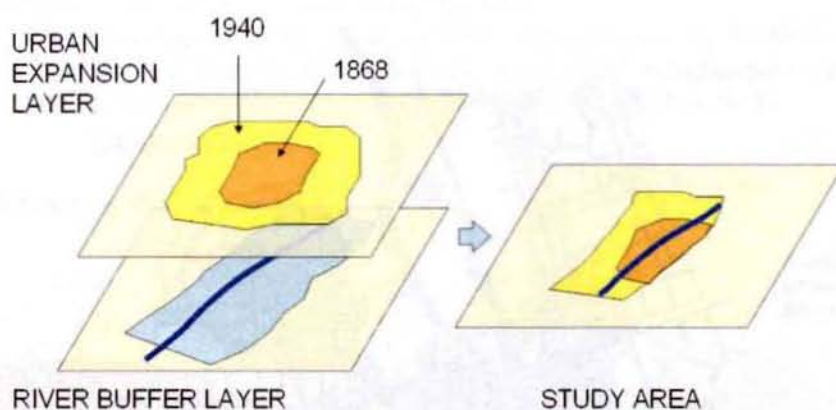


Fig. 5.6. The study area according to the distance from the river. Map made by the author.

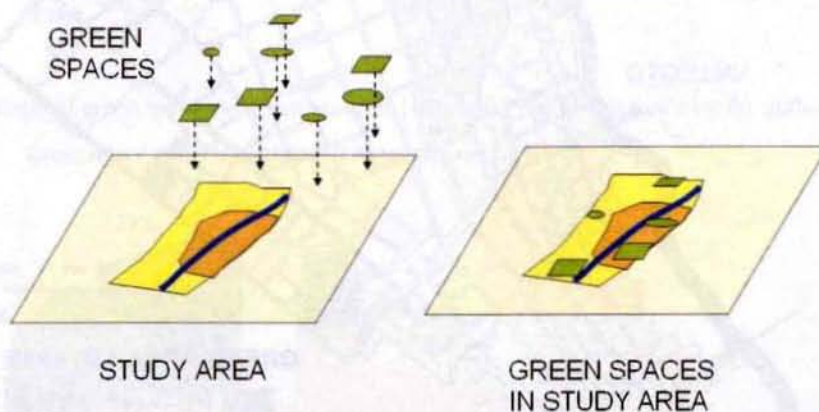


Subsequently, the urban expansion layer that was already made in the previous section will be superimposed to the area of influence of the river, in order to identify which urban areas have a relation with the riverfront (**Fig. 5.7**). In that way, the area of study will be defined. There were no parks in colonial times; therefore we will only consider the urban growth up to 1868 and the one in 1940.



**Fig. 5.7.** General scheme of the study GIS analysis.

Finally, the layer containing the green areas will be superimposed over the study area in order to determine the public spaces in the surroundings of the Chili River (**Fig. 5.8**). In that way, it will be possible to differentiate the location of green areas on each époque.



**Fig. 5.8.** Scheme of the definition of greenery zones in the study area..

#### (4) Spatial Analysis

The study area is superimposed with the expansion of the city during two époques: the Republic (before 1868) and 1940, covering an extension of 241 ha. (Fig. 5.9). It can be observed that most green public areas were located in the zone of the influence of the river. It is also clear that most of these areas were developed after 1868.

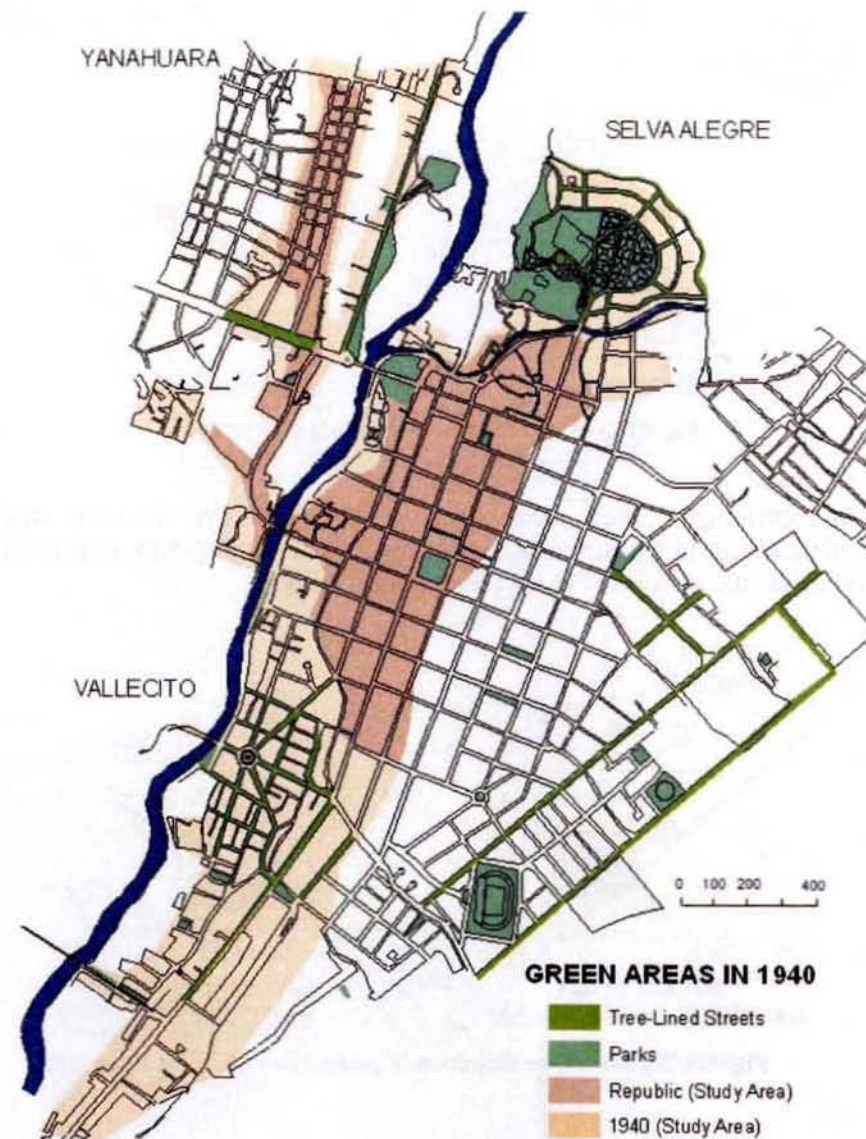


Fig. 5.9. Green Areas in the study area. Map made by the author.



The Republic area that fits within the study area had very few public parks and no tree lined streets (the Main Square was an open Market at that time). The green areas occupied only the 0.31% of the urban fabric at that time. Considering a population of 22150 inhabitants (Gutierrez, 1992,) the amount of green areas per person was 0.14 m<sup>2</sup>/inhabitant.

The study area in 1940 had 22.5 ha corresponding to parks and 18.5 ha to tree lined streets, which corresponded to 9.24% and 7.70% of the study area respectively. The rate of green areas per inhabitant in Arequipa rose to 6.28 m<sup>2</sup>/inhabitant. (Fig. 5.10)

If we consider only the expansion of Arequipa to 1940 without considering the 1865 area, the 25% of that expansion was devoted by parks and boulevards, which clarifies the interest that the planners put into landscaping the new urban developments near the Chili River. (Fig. 5.11)

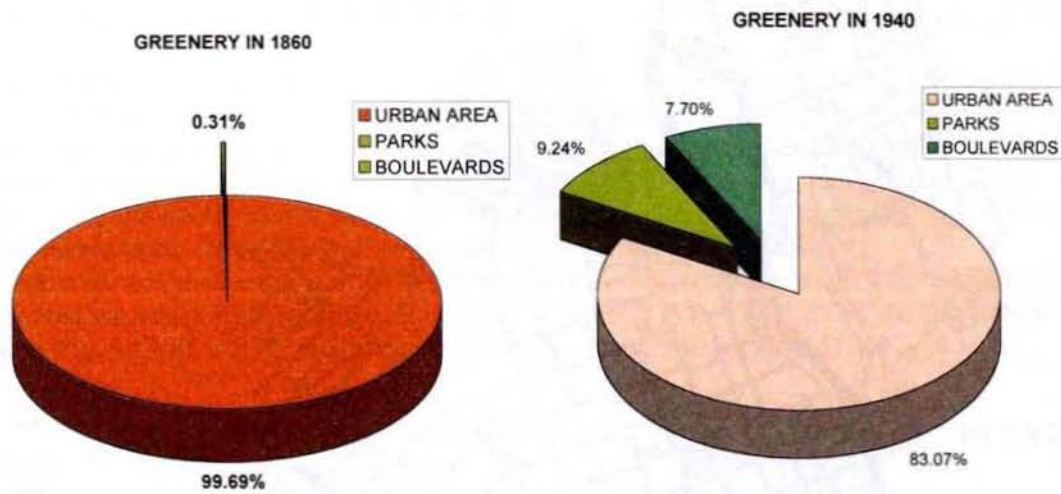


Fig. 5.10 Comparison of green areas vs. urban areas in 1860 and 1940. Chart made by the author.

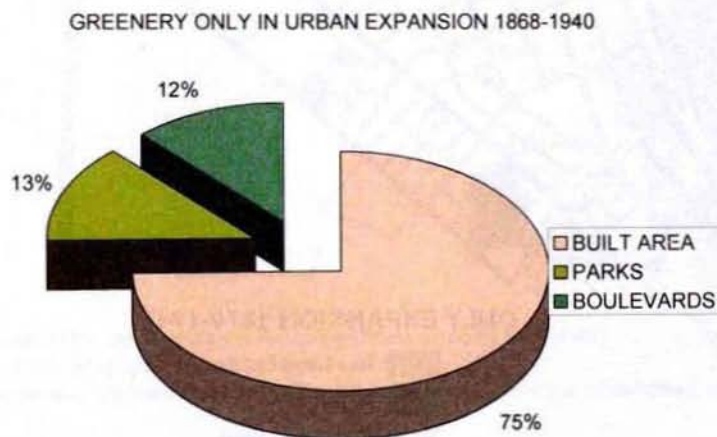


Fig. 5.11 Percentage of green areas only in the urban expansion from 1870 to 1940.

Most of parks and tree-lined streets were built in the suburbs. Therefore, if only the expansion of Arequipa to 1940 is taken into account, without considering the 1865 area, the 25% of that expansion was devoted by parks and boulevards. This high percentage of green areas clarifies the interest that the planners put into landscaping the new urban developments near the Chili River. (Fig. 5.12)

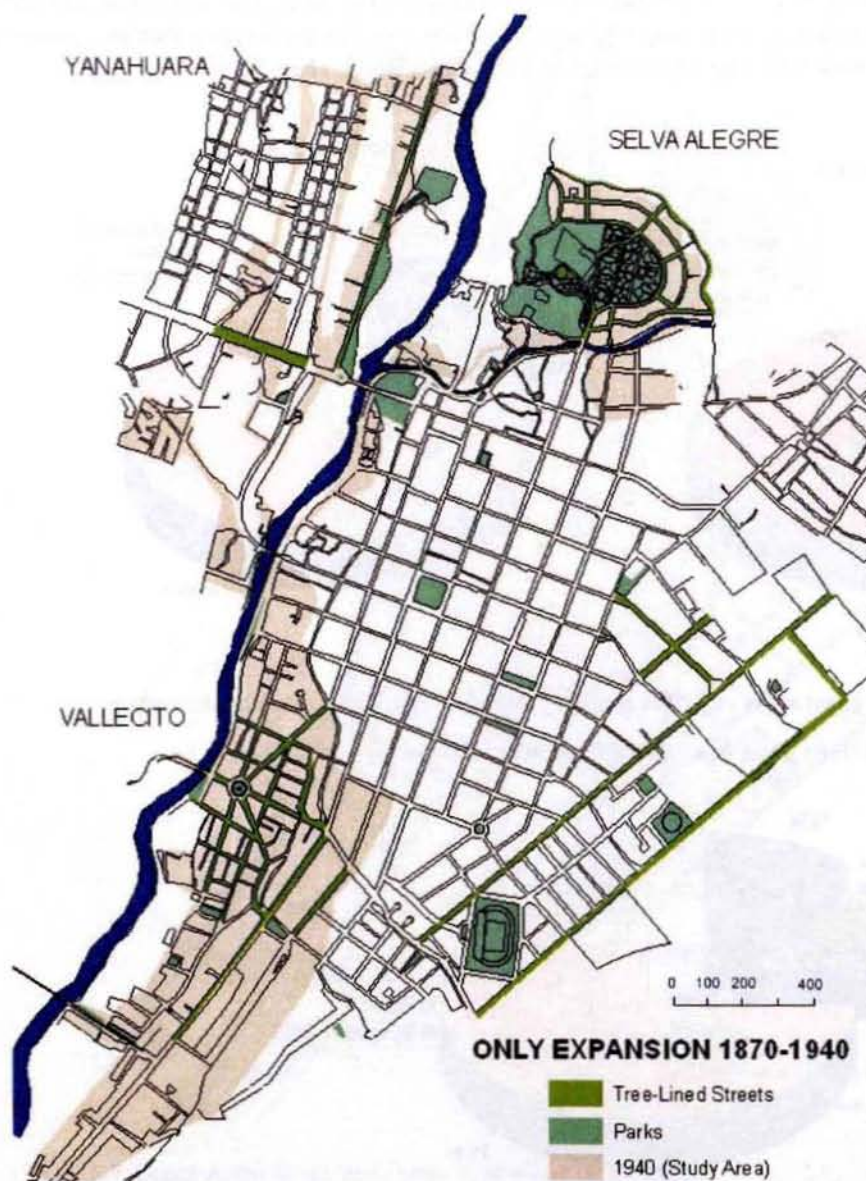


Fig. 5.12. Green Areas only in the expansion from 1870 to 1940 within the study area.



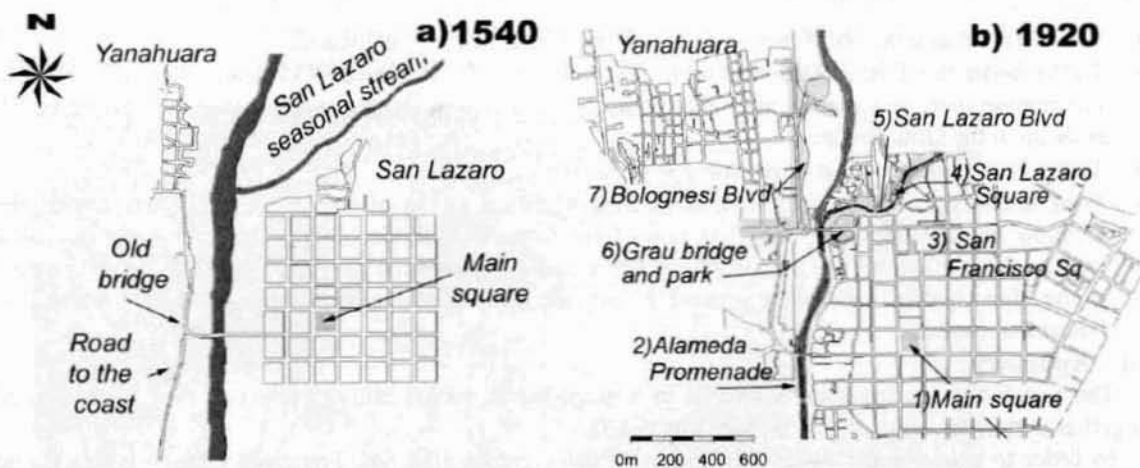
### 5.3 EVOLUTION OF THE SPACES AROUND THE MAIN SQUARE

As it was mentioned before, the transformation of the Main Square has an important impact on the population. The beautification of the square was the first tangible expression of the Hygienist ideas and was a clear reference in the development of a new collective conscience regarding the relation of the city with the landscape. After the upturn of the Main Square other, plazas, streets and public spaces in the central area and particularly near the Chili River were also transformed and landscaped. However, this process was slow and discontinuous, influenced by external factors (such as the war against Chile or the First World War in Europe) or internal ones (like the local revolts or the celebrations for the Arequipa's 4<sup>th</sup> centennial).

At the beginning, this process of transformation of public spaces was related to the improvement of the existing public spaces in the city, but then was a part of the urban expansion. As a result, three particular stages can be distinguished in the approach of the city to its riverscape: 1) Inside the central area 2) In the riverfront 3) In the new urban developments.

The first period began after the completion of the first remodelling of the Main Square and lasted from 1899 to 1905. This phase is related to the transformation of other plazas from open markets into parks. These spaces were located between the Main Square and the Chili River, but not directly in the riverfront area. However, this period is important because it consolidated a new way of experience the public spaces in the city, improved the perception of surrounding monuments and contributed to the development of landscape values among the population.

After the completion of the first remodelling of the Main Square (1) in Fig. 5.13.b), this stage involved the transformation of the San Francisco Square (3) in Fig. 5.13.b), the San Lazaro Square (4) in Fig. 5.13.b), and the reconstruction of the San Lazaro Boulevard (5) in Fig. 5.13.b),



**Fig. 5.11.** Evolution of the urban spaces in Arequipa (Maps made by the author)

a) From 1540 to 1800 Arequipa had no landscaped spaces

b) Catalytic process after the transformation of the Main Square. Aerial view of the urban system in 1920.

### (1) The San Francisco Square

#### a) Location and physical configuration

The San Francisco Square (3) in Fig. 5.13.b, Fig 5.14) is located 300 m North to the Main Square and measures 25 by 50 meters. Due to the socio political power and the importance that the Catholic Church used to have in colonial times, the Franciscans occupied one and a half blocks from the original grid layout. (Fig. 5.15)

Regarding its built surroundings, the square is surrounded by the massive architecture of two temples forming an “L” shape:



Fig. 5.14. Location of the San Francisco Square with respect to the Main Square

Fig. 5.15. San Francisco Square and surrounding elements: San Francisco Church, Tercera Orden Church and former Jail. Source: Google Earth

- To the east square the San Francisco Church (first built in 1569) is located.
- To the north, the Tercera Orden Church, first built in 1775, is placed. (Cortázar, 1969, 47)<sup>5</sup>. Next to this temple there is a narrow alley that connects the plaza to the transversal Ayacucho Street which ends up in the Grau Bridge.
- To the South, the square is open (Melgar Street)
- West to the square there is a mansion which belonged to the priest Fierro and functioned as the Colegio de la Educandas, the first school for women built during the colony. After the 1868 earthquake, the school was relocated and the mansion became the jail (which used to be placed next to the Municipality in the Main Square). Finally the jail was relocated again in 1920 and the mansion became a museum.

#### b) Approach

The San Francisco complex is located in a mega-block, which is the product of two blocks joined together within the original grid layout (Fig. 5.15).

In order to enhance the visual perception of the complex, the San Francisco Church's facade and Campanile are aligned with the axis of the street that leads to the Main Square. Therefore, the church is facing the observer while he is approaching from the Main Square.

The alignment in the axis of the street, the massive facade and the setback of the atrium, are key elements that have emphasize the church as a visible urban landmark from the Main Square. (Fig. 5.16)

#### c) Evolution of the landscape design

During the colony, the plaza was used as an open market and the neighbours used to collect water from its fountain, and eventually to celebrate traditional religious festivities.

In 1899 the square was remodelled as a park, being called the 28 de Febrero Park, honouring the

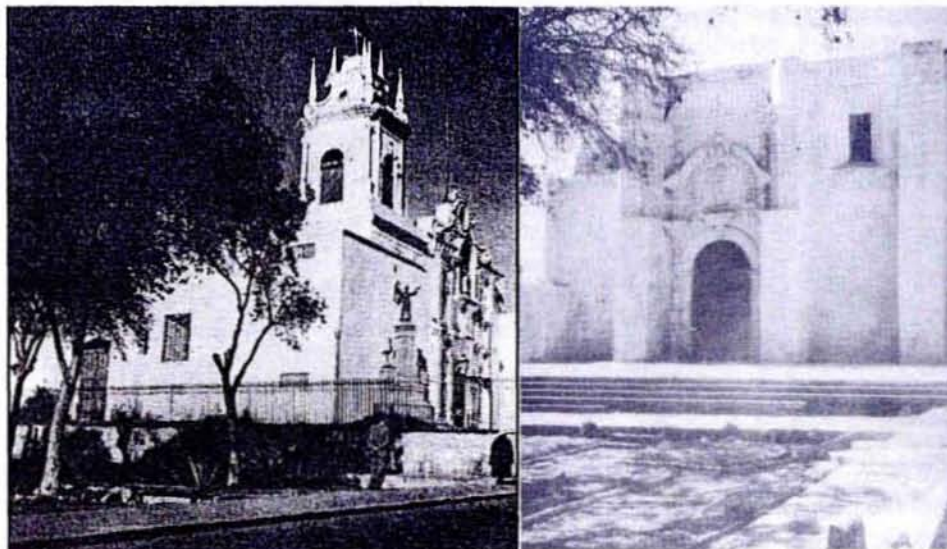




**Fig. 5.16.** Approach to San Francisco Church from the Main Square. 1870. Photo by Vargas.  
3D made by the author based on field survey

patriotism of the Arequipan people during the revolution of 28<sup>th</sup> of February 1865. Next to the fountain, a granite pyramid was placed, commemorating the sacrifice during the revolution (Pantigoso, 1951, 28)<sup>6</sup>. (Fig. 5.20). The sidewalks were designed in a star like shape, which center was the obelisk, following a similar pattern as the first design of the Main Square. The small gardens or parterres were planted with several *jacaranda mimosifolia*, an ornamental South American tree with blue flowers and a leafy top, that gave human and intimate scale to the space.

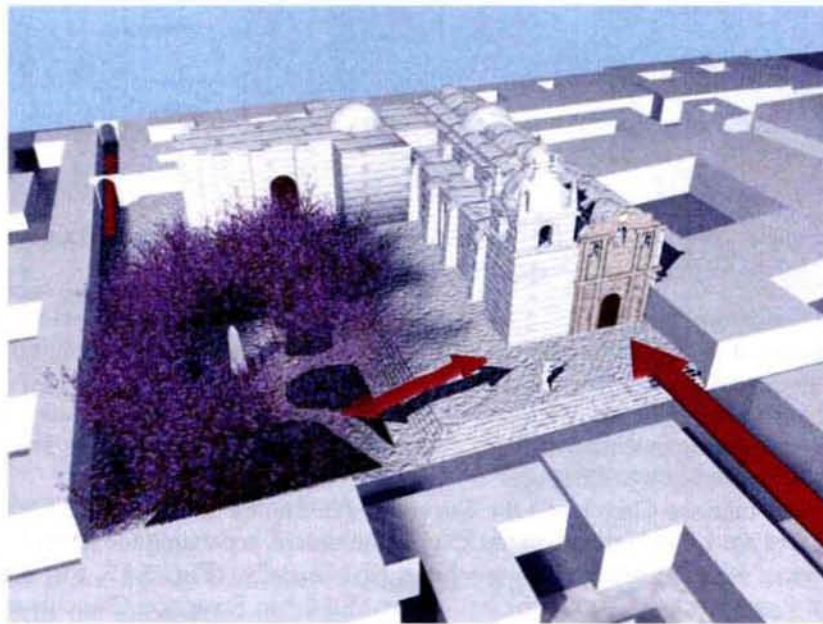
The atria of the San Francisco Church and the Tercera Orden Church are surrounding the plaza in an "L" shape. These spaces are 1.0 m higher than the level of the square, separating the sacred area from the public one. Both spaces were integrated with amphitheater-like stairs. (Fig. 5.17, Fig 5.18). Also, a brass statue of Saint Francis was located at the left corner of the San Francisco Church's atrium, along



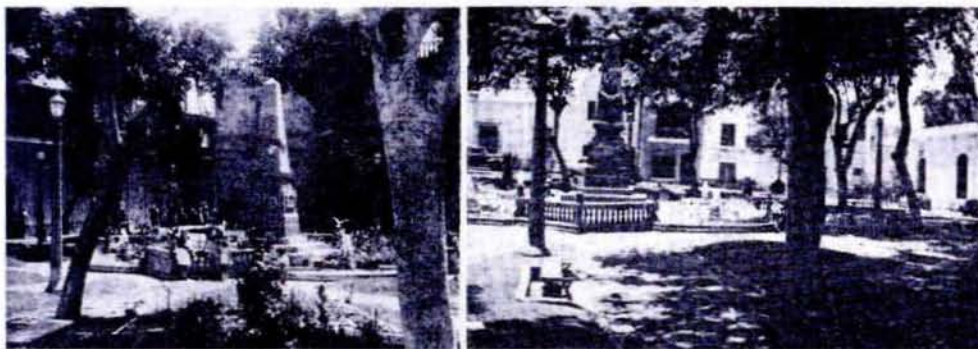
**Fig. 5.17.** San Francisco Church, and the sculpture of San Francis in a corner, before the 1958 earthquake  
**Fig.5.18.** Tercera Orden church, showing the atrium and the stairs in front of the square.

with other sculptures representing a wolf and a heron (Pantigoso, op cit, 28). (Fig. 5.17). The image of the saint with open arms welcomed the pedestrian approaching to the church.

The remodelling of the plaza allowed a better perception of the architecture of the San Francisco Church, promoting the social exchange of the citizens and creating a charming space which floor was frequently covered with the blue flowers and the welcoming shadows of the jacaranda trees. Moreover the square continued to be a symbolic space, where religious festivities were held. At the same time, this plaza was an intermediate space on the way from the Main Square to the Chili River.



**Fig. 5.19.** Francisco Church and Tercera Orden Church defining the Square. An obelisk later replaced the central fountain. 3d model made by the author based on field survey.



**Fig. 5.20.** Two pictures of San Francisco Square showing the obelisk, a monument to the revolution of February 28th 1865. This monument remained in the square until the 1958 - 1960 earthquakes



## (2) The San Lazaro Urban system

As it was explained in the chapter 2, San Lazaro was a neighbourhood built upon a pre Hispanic settlement next to a seasonal stream. From 1904 the urban spaces in this neighbourhood were remodelled favouring a development of the open spaces located besides the stream.



**Fig. 5.21.** San Lazaro urban system, based on a 1944 aerial photography

- 1) San Francisco Square. 2) Ayacucho Street. 3) Independencia Square 4) San Lazaro Seasonal Stream 5) San Lazaro Square (or Calienes Square). 6) San Lazaro Church. 7) San Lazaro Boulevard 8) Campo Redondo Square

#### a) The San Lazaro Square

The San Lazaro Square also called Calienes Square (León, 1963, 38)<sup>7</sup>. (4 in Fig. 5.13.b, 5 in Fig. 5.19) is located in front of the San Lazaro Church (6 in Fig. 5.21). As it was mentioned in the chapter 3, the San Lazaro neighbourhood was a *reducción* for Indians. The San Lazaro Square was originally the wide atrium of the church, where the native Indians used to be evangelized. The natives did not use to enter inside the churches because in times of the Incas only the priests were allowed to go inside the temples. During the colony, because of racist practices, the Spanish conquerors attended mass inside the church while the Indians did it outside, in the atrium. After the independence, all the masses were heard inside the church, and the atrium became an open market, which also accommodated the relocated market while the remodelling works of the San Francisco square (Gutierrez, op cit, 179).

In 1904 the San Lazaro square was also remodelled as a park. It was a separated space from the church's 8 m wide atrium, which was protected by an iron fence (Fig. 5.22). The small plaza, which measures 23 m by 27 m, was located right after a bridge over the San Lazaro stream. The space of the square was not fenced, but it was virtually delimited by 1.40 m height columns made of stone (Fig. 5.21). The sidewalks were also made of stone and pebbles and they were designed forming a cross. Four small parterres planted with grass and ficus trees, were located one in each corner. The urban furniture such as benches and street lamps were added to favour a better perception of the facade of the San Lazaro Church and the nearby San Lazaro Boulevard.

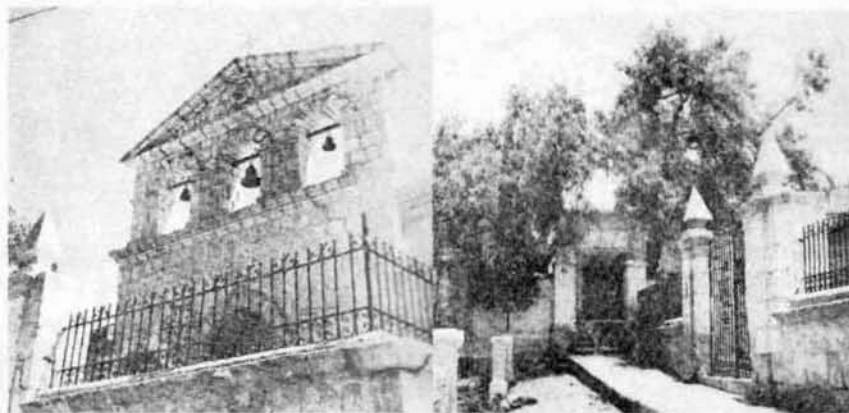


Fig. 5.22. San Lazaro Church's facade

Fig. 5.23. San Lazaro Square and atrium of the Church in 1940.

#### b) The San Lazaro Boulevard

Along the San Lazaro seasonal stream or *torrentera* and next to the San Lazaro Square, the San Lazaro Boulevard (5 in Fig. 5.13.b, 7 in Fig. 5.21) was located. During the colony the San Lazaro neighbourhood was considered a segregated area by the conquistadores (Gutierrez, op cit, 28), because of its social ethnic composition (a zone for native Indians), its organic layout and its location, partially situated beyond the seasonal stream. Therefore, the construction of a park and boulevard along the stream spatially and socially linked the San Lazaro neighbourhood with the rest of the city.

Aside of its aesthetical function and ecological importance the San Lazaro Boulevard had a role in the city's hazard management by controlling the floods of the stream during the rainy season.

However, eventually during a heavy rain the fury of the stream could overpass the defence and damage the nearby areas.

This boulevard was one of the first organic promenades around the river area built in 1855. Unfortunately it was affected by the 1868 and destroyed by the floods. The reconstruction of the boulevard in 1904 as a beautiful promenade filled with trees, especially willows (López, 2006. pers. comm), connected the San Lazaro Square with the Quinta Vargas (later called Grau Park) in the proximities of the Chili River.

The San Lazaro Boulevard was a propitious place for the social exchange of the population (Fig. 5.24 b). Víctor Benavente mentions among the old popular traditions in the ancient Arequipa the one of the “*mentideros*” (places to lie) (Benavente, 1963,65)<sup>8</sup>. The San Lazaro Boulevard was a famous *mentidero*, a place where the senior inhabitants used to meet to enjoy a cigar and sit in stone benches under the shadows of the willows next to the *torrentera*. The *mentideros* were places where these old neighbours used to discuss and get informed about the local, national and international news, especially the ones related to the politics, and they were called *mentideros* because most of these news were based in lies or rumours that the old men used to invent in order to spend their peaceful afternoons.

The 1958 and 1960 earthquakes destroyed the boulevard. It does not exist anymore.

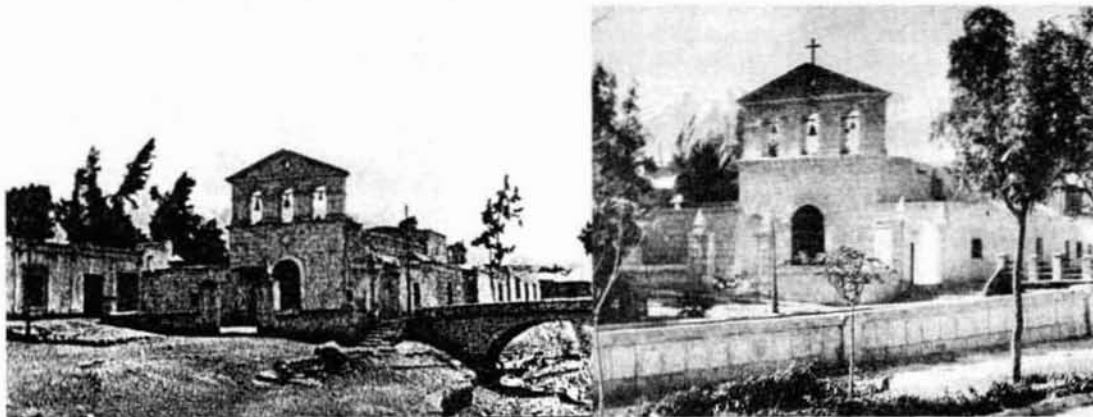


Fig. 5.24.

a) San Lazaro Church before the transformation in 1880

b) San Lazaro Boulevard and San Lazaro Church in 1940. Beyond the fence, next to the boulevard, the San Lazaro stream is located

### c) The Independencia Square

The small Plazoleta Independencia (Independence Small Square) (3 in Fig. 5.21, 5.25) was a small park built by the Municipality of Lima in order to commemorate the sacrifice of the Arequipan heroes during the war of Independence. It was built in 1923 by the president Augusto B. Leguia and the Major Emilio Gomez de la Torre.

The Plazoleta Independencia had a trapezoidal shape and it was located at the



Fig. 5.25. Independencia Square with the statue of the Independence and the Art Noveau street lamps in 1940

beginning of the San Lazaro Boulevard. It has few trees and greenery, and a column with a statue of the independence was located in the middle of the park (Leon O., op cit, 38). An iron fence protected the small square and it was equipped with urban furniture, such as benches and Art-Nouveau style street lamps (Fig. 5.25).

#### d) The Campo Redondo Square

The Plazuela Campo Redondo (Fig. 5.26, 8 in Fig. 5.21) got its name in honour to Pedro Campo Redondo, the Spanish conquistador who traced the layout of Arequipa. For several years this small square was believed to be the place where Arequipa was founded, but this hypothesis has been already discarded, since it has already proved that Arequipa was founded in the Main Square.

The Campo Redondo Small Square, also known as Plazuela del Matorral (Small square of the bush) is located amidst the San Lazaro neighbourhood where three tortuous alleys meet: Violín, La Bayoneta and Combate Naval. The irregular shape of the plaza and the winding roads "remind the streets in the Southern Spain or Northern Morocco, with a strong Andalusian influence, a fusion with native elements imposed by climatic and material conditions and because of the volcanic nature of the soil" (Zaballos C., 1974,8)<sup>9</sup>.

Campo Redondo is a dry square. In the center of the plaza there is a commemorative pillar and a couple of willows grow next to the ancient water canal that runs along one of its sides. Despite this urban space was not a part of the remodelled urban spaces between 1868 and 1940, it has an important role in organizing spatial system in the San Lazaro Neighbourhood.



Fig. 5.26. Campo Redondo Square in 1940, with a neighbour sited next to the commemorative pillar

### (3) Synopsis

In the subsequent years to the remodelling of the Main Square, other public spaces were upturned from open markets into parks.

These spaces allowed the citizens to enjoy passive recreational activities as well as favored the contemplation of the architectural monuments in front of the plazas. These plazas were spatially linked to other spaces, generating movement and inviting the passers-by to walk along sequential spaces.

The landscape design of these spaces was influenced by the Main Square in the use of trees, the arrangement of furniture and the arrangement of the pavements, but differently from the monumentality of the Main Plaza, these spaces offered a more human and intimate scale to their users.



## 5.4 THE APPROACH TO THE RIVERSCAPE

This process started almost at the same time that the evolution of the spaces within the Central Area, but in other geographical location, in the riverfront areas. The starting point of this process was the construction of the Grau Bridge (1884-98) and it lasted until 1913. In that period it was also important the improvement of the Old Bridge (first built in 1558) and the reconstruction of the Paseo de la Alameda Promenade.

### (1) The Paseo de la Alameda Promenade

This promenade was located on top of the Eastern rim of the Chili, contiguous to the Old Bridge, with an extension of 300 *varas* (251.7 m) and 30 *varas* wide (25.1 m) (Gutierrez, 1992, 112)<sup>10</sup>. The promenade was “divided in two parts, clearly separated by a majestic arch. The front part near to the bridge had two pinnacles framing the entrance and a wide area before the arch. The promenade was flanked by trees and fountains in the middle” (Blanco, 1834)<sup>71</sup> (Fig. 5.27, 5.28). The Priest Blanco, a renown artist who visited Arequipa, praised the 6 m high arch in the promenade as “one of the best taste in Arequipa...made in Tuscan order, the same as the cornices, architraves and friezes”. Due to the Independence war the “coat of arms of the Spanish Crown carved in its plinth was replaced by the one of the Republic

Unfortunately, the 1868 earthquake destroyed the arches and other structures and it remained abandoned for several years. During the works of remodeling the Main Square, the open market was relocated to the Alameda.

In 1901 it was rebuilt again as a waterfront promenade, but shorter than the original. Moreover, the Paseo de la Alameda Promenade was spatially linked to the Old Bridge and from there to Main Square which was already a park. The Paseo de la Alameda Promenade was also connected to the narrow Loreto Alley, which ran to the south leading to orchards and farms (López, 2006, pers. comm.) (Fig. 5.29, 5.30)



Fig. 5.27. Frontal view of the Paseo de la Alameda in 1860, showing the Arch at the entrance

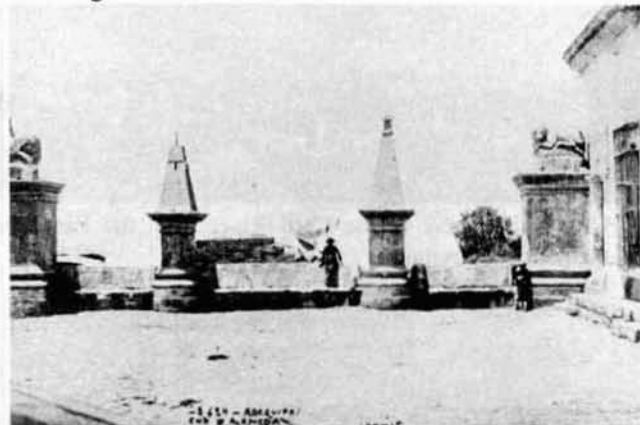


Fig. 5.28. Lateral view of the Paseo de la Alameda in 1860, showing the pinnacles and other furniture



Fig 5.29. Aerial perspective made by the author based on old pictures and Priest Blanco's Diary



Fig 5.30. Lithography of the Chili River from the Paseo de la Alameda, near the Old Bridge. 1860. Municipality of Arequipa

## **(2) The Grau Bridge Urban System**

### **a) The Grau Bridge**

Before the end of the XIX century Arequipa was clearly divided in two sectors. The first one was the Central Area, where the main public buildings, churches, institutions, commerce and mansions were located, as well as the popular housing areas. The other zone was located in the other bank of the Chili River where some rural settlements were located and it was crossed by roads leading to the highlands of Cusco. Both sectors were linked by one bridge called El Puente (the Bridge), first built in 1558.

The project of building a new bridge was initiated in 1868 (Administración Local de Arequipa 1884, 33)<sup>11</sup> but the construction was paralyzed after the earthquake in that year.

The new bridge was designed by the Italian architect Juan Albertazzo and built in stone by the architect Juan Rodríguez (Administración Local de Arequipa, op cit, 34). The project was started in July 1884 and finished in 1888. In October of 1884 the New Bridge was renamed Grau Bridge while the Old Bridge was called Bolognesi Bridge after the two main heroes in the Peru-Chile war, Miguel Grau and Francisco Bolognesi. Due to the difference of the topography level between the two riverbanks, the construction involved an expensive budget from the Municipality and a huge amount of labor (Bedoya 1886, 58)<sup>12</sup>. Hundreds of citizens and even the army participated voluntarily in its construction, utilizing debris from the 1868 earthquake to fill its structure (La Bolsa, 3<sup>rd</sup> of May 1887, p.1)<sup>13</sup>. After its completion, proposals were made to embellish the riverfront areas and to unify the two bridges with “beautiful promenades” (La Bolsa, op cit, p. 1).

The Grau Bridge (6 in Fig. 5.31) was built in order to link the two riverbanks, especially the

northern part of the city with the traditional towns of Yanahuara and Cayma in the west. However, it also had an important role in the perception of the riverscape. Even before its official inauguration in 1888 the bridge was utilized as a preferential viewpoint for enjoying the riverscape, where the population used to stroll and make parades (Bedregal, 2001, 8)<sup>14</sup>. It also favoured the economic and recreational integration of the city, by joining the public bath located in the right (East) bank (called Quinta Vargas) and the left (West) bank (called Zemanat)

The innovative characteristic of Grau Bridge is that it was not only a mere bridge, but its design included decorative elements such as balustrades, street lamps in Art Nouveau style, and a neoclassical park located in a remaining area of the "Quinta Vargas" between the bridge and the San Lazaro boulevard. (Fig. 5.32)

During the administration of the Mayor De Romaña in 1914 the Arequipa Electric Tram Company was notified in order to extend its service to the Grau Bridge (de Romaña 1916, 14)<sup>15</sup>. Because of the tram, the bridge was one of the more transited roads in the city in the decade of 1920s (Bedregal, op cit, 9)

The Grau Bridge had also a catalytic effect by stimulating the creation of other recreational spaces and approaching the city to its riverscape: Next to the bridge, the Grau Park (also known as Quinta Vargas) was built in 1905 and it was the first public space specifically designed as a children's playground. The San Lazaro Blvd. was connected to the Grau Bridge in 1905. In 1908 the Villalba Street linked the Grau and the Old bridges, and also the aforementioned Paseo de la Alameda Promenade, which was reconstructed after the earthquake. Some of the balconies built to overlook the river from that street can still be appreciated nowadays.



**Fig. 532.** Grau Bridge in 1930, showing the tramline and the urban furniture utilized in the bridge: balustrades, neoclassic street lamps and benches. Next, the Grau Park



#### b) The Grau Park

One of the oldest traditions of the Arequipan inhabitants was taking baths in springs or hot springs, upon which medicinal properties were attributed. One of those baths, whose water used to be supplied from an small town in the north called Chiguata (Emmel 1928, 8)<sup>16</sup> was located in the right riverbank, in the area where the Vargas family used to have their mansion (Quinta Vargas). The existence of the baths in both riverbanks (Quinta Vargas in the East and the Zemanat baths in the West riverbank) was very important for the municipal administrations, and special inspectors were appointed in order to watch for the hygiene and healthiness of these public baths (de Romaña, op cit, 14).

In order to build the Grau Bridge the Quinta Vargas was bought by the Municipality (Administración Local de Arequipa, op cit, 34). Taking advantage of the strong retaining walls that were built in both sides of the bridge "in order to give consistence to the terraces" a recreational park called Grau Park was built (6) in Fig. 5.13.b, 5 in Fig 5.30), renovating the pool and hot spring and including an area specifically designed as a children playground for the first time in Arequipa.

The entrance of the park was located perpendicularly to the Grau Bridge and it was formed by two columns, framed by volutes in neo classical style and crowned by flower pots (Fig 5.33, Fig. 5.34).

Since the park was located in a lower level than the bridge, offering intimacy and protection from the traffic in the city, two elegant stairs adorned by balustrades, streetlamps and flowerpots formed the access. The "gardens and fountains turned the park into a very popular place for the recreation of the population" (Emmel, op cit, 16).



Fig. 5.33. View of the entrance and stairs from the Grau Park. 1928



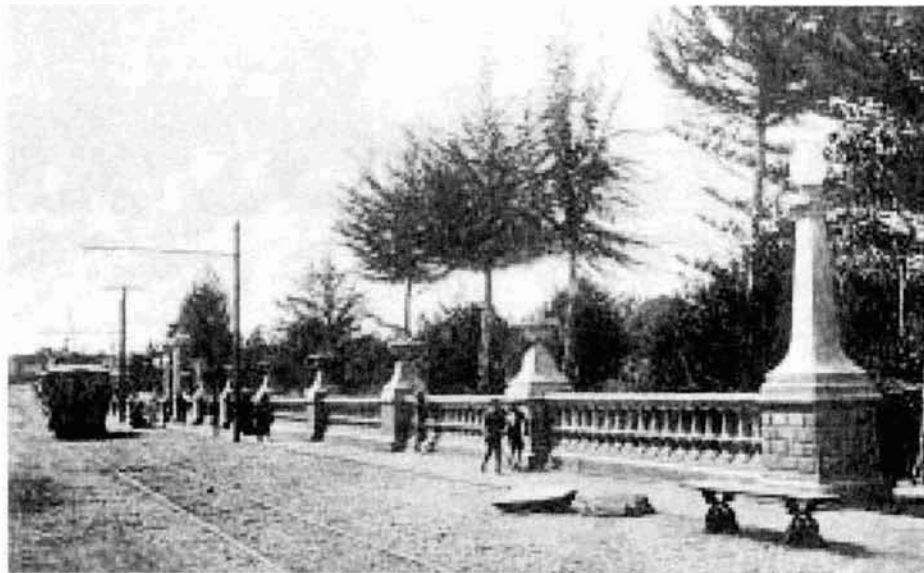
Fig. 5.34. Details of the entrance and balustrade. Photos by the author.

northern part of the city with the traditional towns of Yanahuara and Cayma in the west. However, it also had an important role in the perception of the riverscape. Even before its official inauguration in 1888 the bridge was utilized as a preferential viewpoint for enjoying the riverscape, where the population used to stroll and make parades (Bedregal, 2001, 8)<sup>14</sup>. It also favoured the economic and recreational integration of the city, by joining the public bath located in the right (East) bank (called Quinta Vargas) and the left (West) bank (called Zemanat)

The innovative characteristic of Grau Bridge is that it was not only a mere bridge, but its design included decorative elements such as balustrades, street lamps in Art Nouveau style, and a neoclassical park located in a remaining area of the “Quinta Vargas” between the bridge and the San Lazaro boulevard. (Fig. 5.32)

During the administration of the Mayor De Romaña in 1914 the Arequipa Electric Tram Company was notified in order to extend its service to the Grau Bridge (de Romaña 1916, 14)<sup>15</sup>. Because of the tram, the bridge was one of the more transited roads in the city in the decade of 1920s (Bedregal, op cit, 9)

The Grau Bridge had also a catalytic effect by stimulating the creation of other recreational spaces and approaching the city to its riverscape: Next to the bridge, the Grau Park (also known as Quinta Vargas) was built in 1905 and it was the first public space specifically designed as a children’s playground. The San Lazaro Blvd. was connected to the Grau Bridge in 1905. In 1908 the Villalba Street linked the Grau and the Old bridges, and also the aforementioned Paseo de la Alameda Promenade, which was reconstructed after the earthquake. Some of the balconies built to overlook the river from that street can still be appreciated nowadays.



**Fig. 532.** Grau Bridge in 1930, showing the tramline and the urban furniture utilized in the bridge: balustrades, neoclassic street lamps and benches. Next, the Grau Park

#### b) The Grau Park

One of the oldest traditions of the Arequipan inhabitants was taking baths in springs or hot springs, upon which medicinal properties were attributed. One of those baths, whose water used to be supplied from an small town in the north called Chiguata (Emmel 1928, 8)<sup>16</sup> was located in the right riverbank, in the area where the Vargas family used to have their mansion (Quinta Vargas). The existence of the baths in both riverbanks (Quinta Vargas in the East and the Zemanat baths in the West riverbank) was very important for the municipal administrations, and special inspectors were appointed in order to watch for the hygiene and healthiness of these public baths (de Romaña, op cit, 14).

In order to build the Grau Bridge the Quinta Vargas was bought by the Municipality (Administración Local de Arequipa, op cit, 34). Taking advantage of the strong retaining walls that were built in both sides of the bridge “in order to give consistence to the terraces” a recreational park called Grau Park was built (6) in Fig. 5.13.b, 5 in Fig 5.30), renovating the pool and hot spring and including an area specifically designed as a children playground for the first time in Arequipa.

The entrance of the park was located perpendicularly to the Grau Bridge and it was formed by two columns, framed by volutes in neo classical style and crowned by flower pots (Fig 5.33, Fig. 5.34). Since the park was located in a lower level than the bridge, offering intimacy and protection

from the traffic in the city, two elegant stairs adorned by balustrades, streetlamps and flowerpots formed the access. The “gardens and fountains turned the park into a very popular place for the recreation of the population” (Emmel, op cit, 16).



Fig. 5.33. View of the entrance and stairs from the Grau Park. 1928



Fig. 5.34. Details of the entrance and balustrade. Photos by the author.



### c) The Bolognesi Boulevard

Even before the people was allowed to transit by the Grau Bridge, the Commissioner of Yanahuara built a provisional road joining the bridge with the Zemanat Baths, a famous hot spring with medicinal and therapeutic properties (La Bolsa, 1887 May 4th, p.2)

In 1908 a road (nowadays called Villalba Street) located in the right riverbank joining the two bridges was paved (Muñoz, 1909,21)<sup>17</sup>. In the same year, in the left bank, the road to the Zemanat bath was paved “with pebbles and a central sidewalk made of *sillares* [volcanic white stone]” (Muñoz, op cit, 24)

That road was later designed as a casual promenade with trees overlooking the Chili River. This linear park was finished in 1910 and called Bolognesi Boulevard (7) in Fig. 5.13.b, Fig. 5.35). It was one of the first and most important public spaces built in the 20th century specifically designed for the enjoyment of the riverscape. It is located on top of the rim, approximately 20 m higher from the level of the river, which gives it the character of a viewpoint, becoming an urban balcony and allowing the perception of impressive views of the Chili River, the farms and the volcanoes (Fig. 5.36).

The Bolognesi Boulevard extends 1.0 km along the river rim. A steep cliff, which conditions the irregular breadth of the promenade, edges its eastern side: the maximum width is 52 m and the minimum one is 12 m. A 1.2 m high balustrade, built in neoclassical style, fences the eastern border. The circulation winds gently, favoring a slow flow of the pedestrians who enjoyed strolling along.

The park included gardens, areas for recreation, civic areas, the monument to Francisco Bolognesi and an arbor structure called “Chinese Kiosk”, which was later moved to the Grau Park (Gutierrez, op. cit, 198). The layout of the gardens is also not geometric following a similar pattern than the one in the Main Square. The arrangement of the greenery in the gardens included geometrical figures, such as stars or spirals, an inspiration of the Italian gardener Lucioni (Carpio, pers. comm 2004). The furniture, benches and street lamps were also made in neo-classical style, such as the ones used in the Main Square, the Grau Bridge and the Grau Park located next to it.

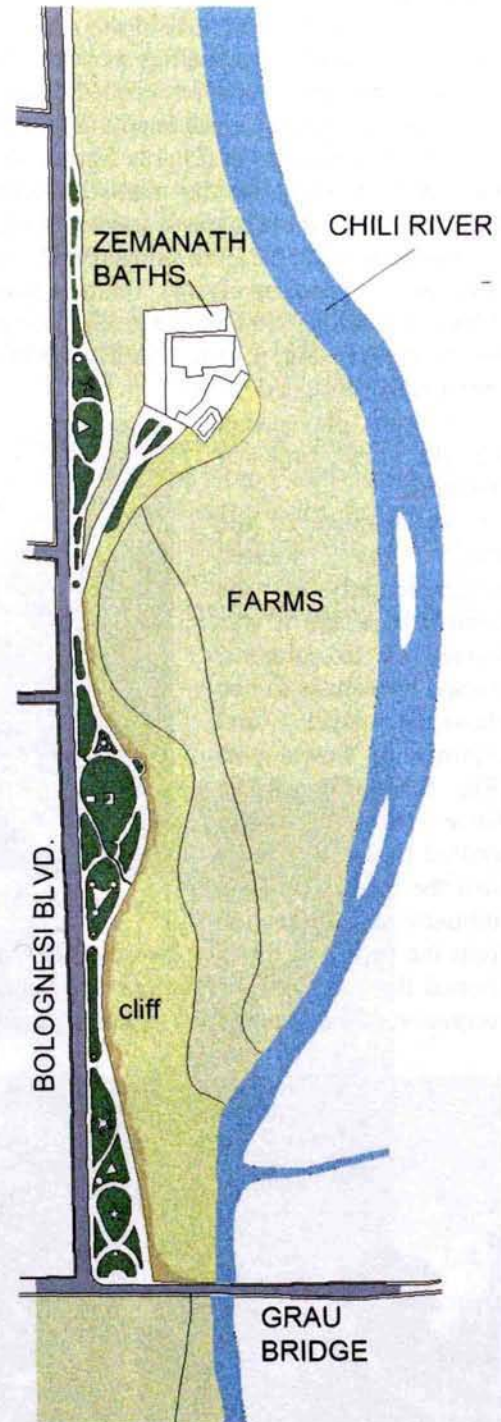


Fig. 5.35. Layout of Bolognesi Blvd. after 1944 aerial photography.



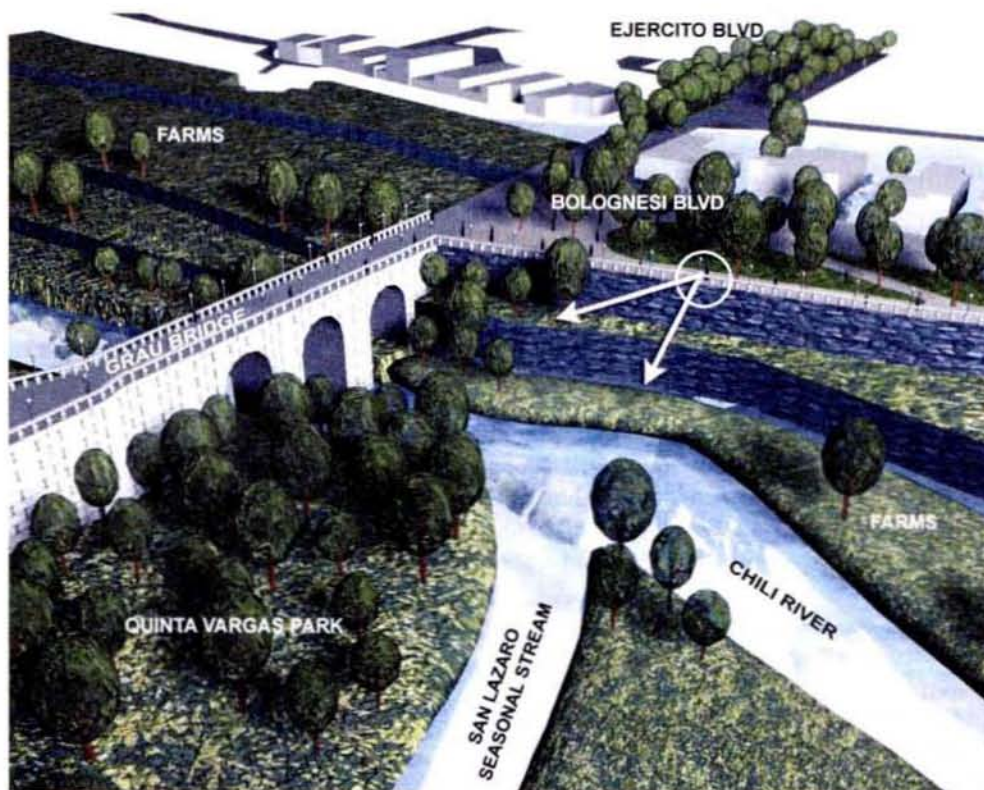


Fig. 5.36. 3D View of the Grau Bridge, Grau Park, the San Lazaro stream, and the Bolognesi Blvd, a riverfront complex around the Chili River.



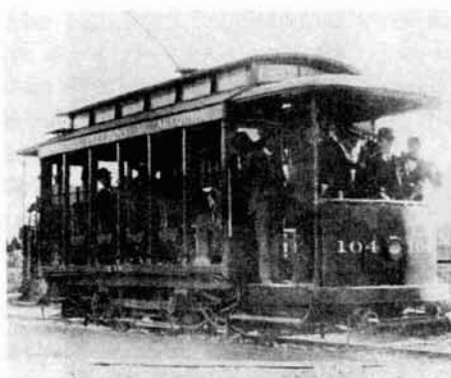
Fig. 5.37. Bolognesi Boulevard in 1915, before the trees were planted

### (3) Tingo

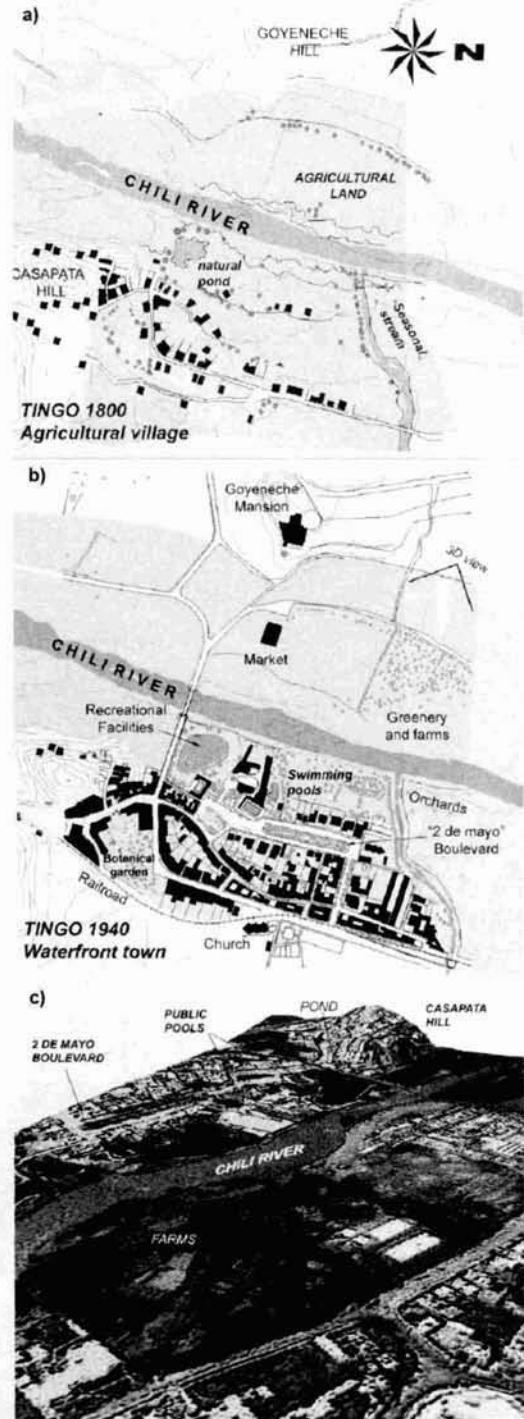
Tingo is located 4 km south from Arequipa, next to the Chili River. *Tingo* in native Peruvian language means “union of two rivers” and this small agricultural village received this name because it was located where a seasonal stream or torrentera joins the Chili River (**Fig. 5.39 a**).

Due to the high phreaticity of the area, containing many currents of shallow underground water, Tingo got famous from the various springs and wells of pure water. Besides, Tingo’s altitude (2200 meters above sea level) was 120 m lower than Arequipa’s and for that reason its weather was milder than the one in the city. During the colony these two characteristics made Tingo a famous place for recreation, especially during the summer season. At the end of the XVIII century the Goyeneche family and the Bishop Juan Sebastián de Goyeneche y Barreda built a big and beautiful summer mansion in Sachaca, in front of Tingo,

However, the development of this area from a rural settlement to a waterfront town (**Fig. 5.39 b, c**) was possible due to the construction of the railway from Arequipa to Mollendo in 1871 and the creation of a train station in the entrance of Tingo. At the end of the XIX century the Arequipan aristocracy chose this area to spend the summer and build their country houses. Later, in 1913 a tramline was built in order to facilitate the transportation of the citizens to this Tingo from the Main Square (Gutiérrez, op cit, 193) (**Fig. 5.38**).



**Fig. 5.38** Tram to Tingo



**Fig 5.39.**a) Tingo as a rural village in 1800  
b) Tingo in 1940 as a waterfront town  
c) 3d view of Tingo based on a 1944 aerial photography

Three zones can be distinguished in the town of Tingo:

### 1) The old quarter

It is the most ancient part. Tingo appeared as a rural settlement next to a rustic road and therefore its urban layout was composed by stone made houses around several organic passages. The most remarkable landmark was the colonial church, which was replaced by a modern one after the 1958 and 1960 earthquakes. In front of the church and the train station the Artillery Headquarters were built in 1940 (**Fig. 5.40**).



**Fig. 5.40.** Military Headquarters in Tingo

### 2) The boulevard zone

This zone was located in the middle of the town, connecting the train station and the area of the pools. The space was organized around a 250 m long palm groove called 2 de Mayo Boulevard (**Fig. 5.39**), around which several summerhouses were built in wood. This wooden architecture, different to the one typically used in Arequipa, was representative from the towns in the coast, and therefore stressed the idea of a recreational area and giving the place a “romantic atmosphere” (Pardo, 1963, 47)<sup>18</sup>. In the middle of the boulevard there was an arbour (**Fig. 5.41**), where an orchestra used to play every Sunday (Rodríguez, 2005, pers. comm) and during the traditional festivities “music competitions, horse displays, cockfighting and other popular entertainment were held here” (Pardo, op cit, 47).

The 2 de Mayo Boulevard was connected to the train station, which was also build in wood, by another tree-lined alley. On the other edge, the boulevard ended on a local market, near the area of the pools.

### 3) The waterfront zone

It is located right next to the Chili River, in a lower area than the boulevard. An artificial pond was finished in 1897 (Gutierrez, op cit, 179), filled with water taken by the river. This pond, euphemistically called “Tingo Lake” was a very popular place to sail small boats (Pardo, op cit, 47) (**Fig. 5.42**).

Next to the pond, and taking advantage of the various springs three swimming pools were located where traditional swimming competitions were held (**Fig. 5.43**). Complementary, a children’s playground, was built, next to hotels and restaurants. A famous casino-restaurant called Reina del Pacífico was built in neoclassical style next to the pond.



**Fig. 5.41.** View of the arbour in the Boulevard

The pond and the pools gave the zone the character of place for water entertainment, and the promenade next to that pond allowed “the enjoyment of the riverscape” favoring the contact of the population with nature (Pardo, op cit, 47).



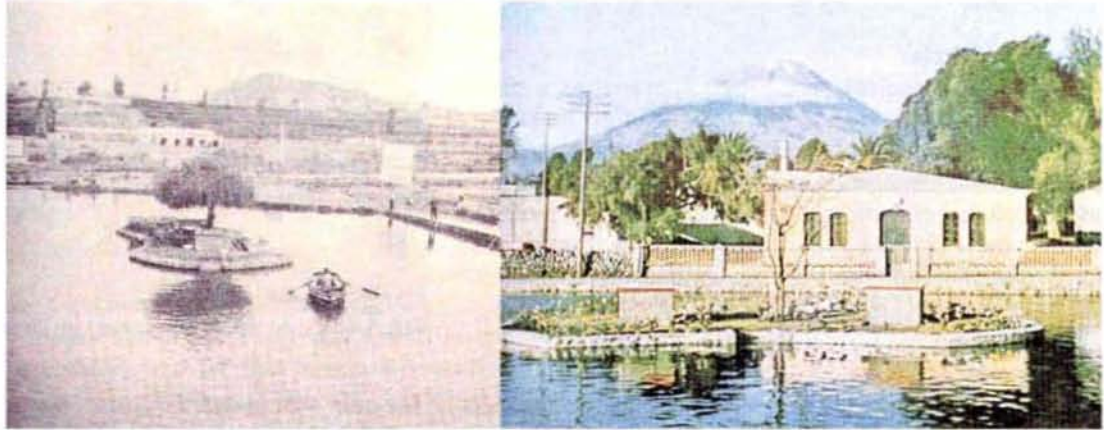


Fig. 5.42. Views of the pond called “Tingo Lake”

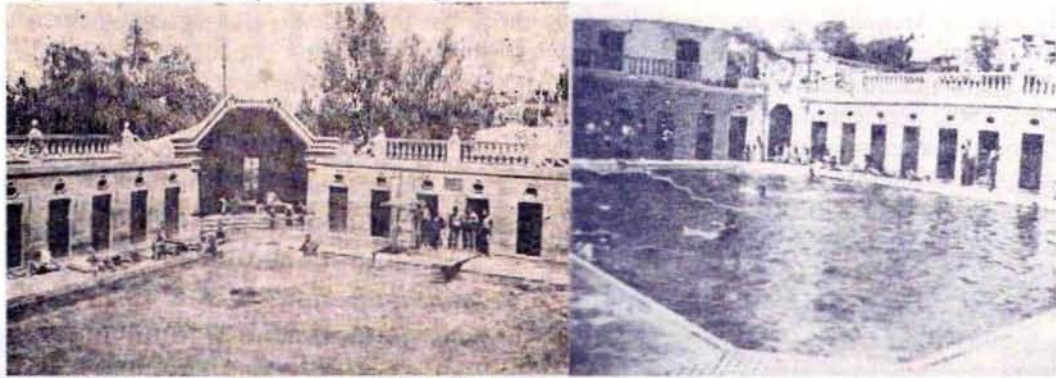


Fig. 5.43. Traditional swimming pools in Tingo.

#### (4) Synopsis

The promenades located in the central area’s riverfront are a combination of street with views to the riverscape, that in this case connect the bridges with other areas (Riverfront Promenade Type) and public spaces with amenities, forming linear parks or urban balconies where the people could choose to stay, enjoy the views or walk along.

These public spaces were also associated with other recreational activities. The Grau Park was equipped with a swimming pool, the Bolognesi Boulevard ended up in the famous Zemanath baths while Tingo achieved development due to its numerous baths and swimming pools. The association between swimming pools-recreational park-riverfront was a concept that had enormous success at the beginning of the XX century, and favored the riverfront development in the subsequent decades.



## 5.5 THE EXPANSION OF THE CITY AND THE RIVERFRONT DESIGN

### (1) Vallecito and the Expansion to the South

During 370 years of history Arequipa's urban layout remained the same as it has been explained in the Chapter two: a gridiron layout with a central square. However, in the 1920s a new area is urbanized in the South of the city, next to the Chili River. This experience introduced new urban layouts, street typologies and architectural styles, the use of a new private plaza and the close relationship with the Chili River.

The urban development Vallecito (Little Valley) is located 600 m south of the Main Square, at the edge of the colonial gridiron. It was built upon a 200,000 m<sup>2</sup> rural area that belonged to the Tirado family (**Fig. 5.45**) (López, pers. comm. 2006) and to the Peruvian Railways Company.

In 1926, the Sociedad Urbanizadora (Development Society) under Mr. Ismael Cuadros carried out the project of 16 blocks housing development. The builders expected the construction of 300 to 400 houses of approximately 400 m<sup>2</sup> within plots of an area of 600 to 1000 m<sup>2</sup> each. The development of Vallecito was difficult, due to the differences in the topography (Vallecito is located more than 20 m below the colonial city).

Its designers considered the project as the "logic extension of the city" (Gutierrez, op cit, 205), but it has many characteristics that made this development radically different than the old colonial city.

#### a) The urban layout

Vallecito introduces a radial pattern with a roundabout in the center. This layout was completely different to the one in the colonial area, based on square blocks and a gridiron pattern. The streets were also broader (13 -16 m) than in the colonial area (8 m). The urban layout of Vallecito was inspired in the French patterns of boulevards used in Paris, at that time considered the "capital of the cultured world" (López, pers. comm. 2006): However the disperse resulting urban space differs from the compact townscape in Paris.

#### b) The landscape design

The project of Vallecito development took into account many landscape considerations (**Fig. 5.46**). One of them was the attempt to connect the Melgar Park (*i*) in Fig 1) in front of the train station (*j*) in Fig 1) with a promenade in front of the Chili River, using a wide street with trees and a circular rotunda. Vallecito was the first suburb with its own plaza, called Juan Manuel Polar. The Sociedad Urbanizadora even brought a German expert in flower-growing, and announced that the central plaza would be



**Fig. 5.45.** 1920 picture of the entrance of the Tirado family's mansion, located in the South edge of Arequipa, where the Vallecito development was built



**Fig. 5.46.** Photography of Vallecito in 1950

“very modern, with symmetrical palm trees” and a promenade next to the river (Gutiérrez, op cit 204). In the eastern side, taking advantage of the difference of topography, a group of small gardens, fountains and stairs were created.

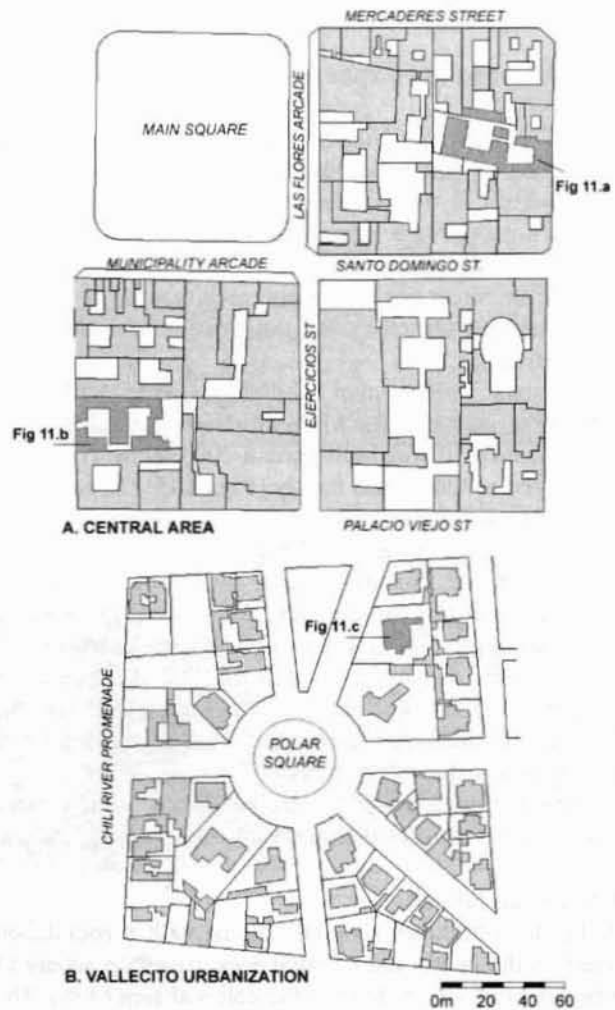
The tree-lined streets were widely used in the planning of Vallecito, in contrast with the treeless colonial streets. A more detailed analysis of the street typologies will be explained in the following chapter.

### c) The urban skyline

The main concept of the urbanization was to “create a neighborhood in a garden city style” (Gutiérrez, op cit 204). In order to give an incentive the sales the plots were sold along with the plan layout of the houses, which were imported from Europe and the United States. For that reason, the individual chalets were located in the midst of big plots defining big frontal setbacks. Differently from the compactness and continuity of the colonial buildings, the houses in Vallecito were surrounded by gardens. For example, the built area in a colonial block around the Main Square occupied the 75 – 80% of the surface. In comparison, the built area in a block in front of the Vallecito’s roundabout occupied only the 25 – 30% (Fig. 5.47).

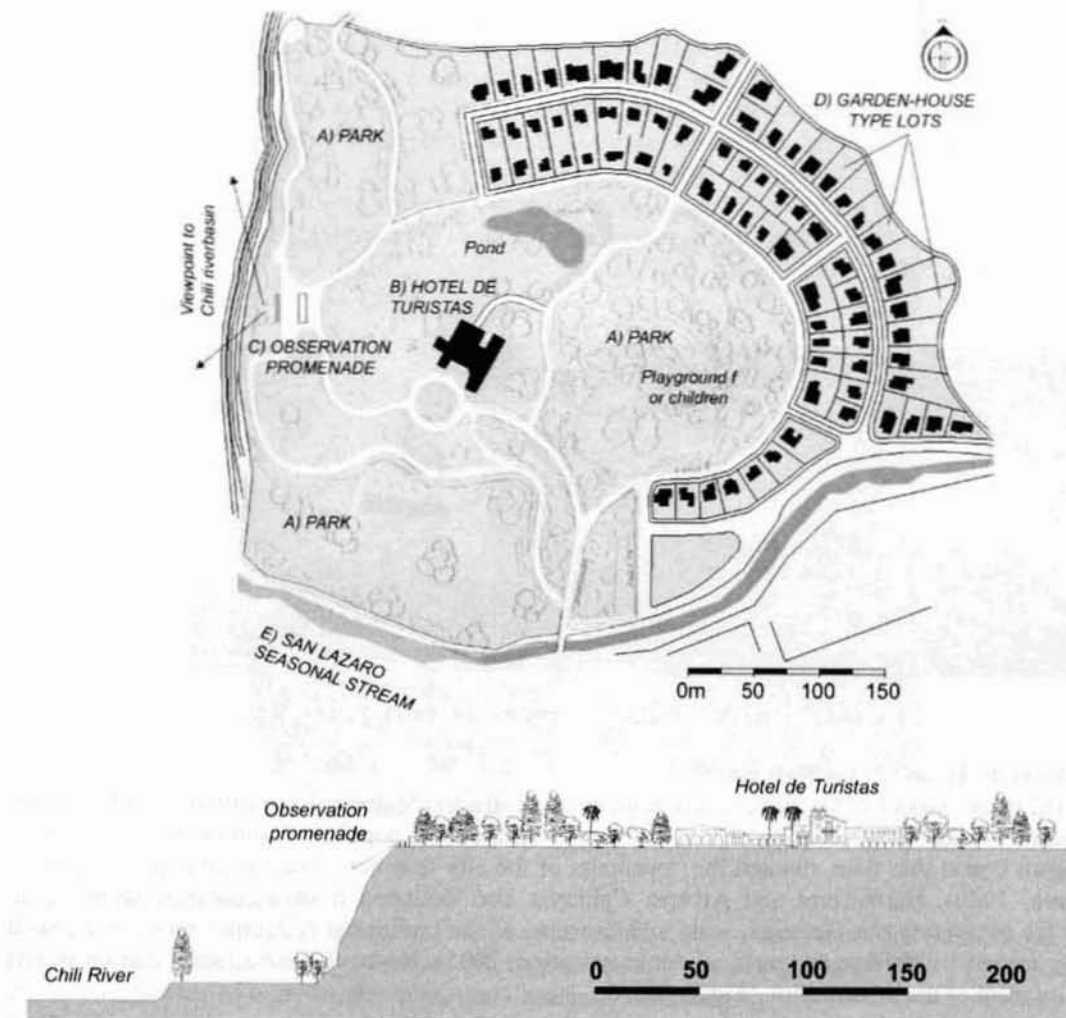
The development of Vallecito was targeted to high class and high middle class citizens, noble families and merchants. However, it took 10 years to occupied the plots since the Arequipan citizen it was reluctant to abandon the central area (López, pers. comm. 2006). Next to Vallecito and besides the river a popular settlement in a much simpler layout called Barrio Obrero was built in 1936, a neighborhood created by the government for the workers.

The construction of Vallecito in 1926 became a breakpoint in the history of urban planning in Arequipa. Despite its success as an urban development, the radial layout of Vallecito was not repeated in the city, although plans were made to create a new neighbourhood in the other river bank, in front of Vallecito, repeating the radial layout (Banco Popular del Peru, 1940, 97)



**Fig 5.47.** Comparative plans of a typical central area block and the new layout of Vallecito. Source: Gutiérrez, 1992.

## (2) Selva Alegre and the Expansion to the North



**Fig. 5.48.** Plan and section of Selva Alegre Urbanization, showing the original scheme of the park.  
Source: Plan layout: De Rivero (1940). Cross-section: field survey.

Arequipan society's ideals about the closeness to nature and the desire to build a city resembling a garden led to the conception of Selva Alegre, a development built as a part of the public works in order to commemorate the 4<sup>th</sup> centenary of Arequipa's foundation in 1940. The revolutionary model, conceived by Alberto de Rivero and designed by the architects and historians Harth-Terre and Alvarez Calderon, was visually linked to the Chili River and involved three main elements: tree-lined roads, a very disperse urban density and a large extension of park (Fig. 5.48). Actually, the concept of the designers was to create a big park containing houses and a Hotel, rather than to build the houses and park separately. Moreover, Selva Alegre initiated the expansion of the city to the north.

In order to carry it out, the Municipality and the government acquired more than 27 ha of rural areas, and linked them to the city with a concrete bridge over the San Lazaro stream. Next, we will describe the main elements composing of the Selva Alegre's urban layout:

**a) The Selva Alegre park.**

With its 200,000 m<sup>2</sup> it measured 20 times the size of Arequipa's main square. The park included large areas of greenery (that is why it took the name of "selva alegre" or "happy jungle"), crossed organically by asphalted roads. Lucioni designed the gardens, as "terraces, embellished with flowers, and stone stairs, pergolas and rustic kiosks". In order to promote social exchange within the park, the design included a children's playground, artificial ponds and fountains, pathways, picnic areas and even a grotto, where religious ceremonies were held. The materials used in those facilities were also integrated to nature, using rustic wood and paved stone. This park, with its fountains and playgrounds became the most popular in Arequipa, lessening the importance of the Grau Park, which was used more locally by the neighbours (**Fig. 5.49**).



**Fig. 5.49.** Views from the Selva Alegre Park, 1940. Source, Pardo

**b) The Hotel de Turistas (Tourists Hotel)**

It is located in the middle of the park, as the main element and an ideological appropriation of the space. The presence of tourists in Arequipa enhanced the pride of the local population, and the hotel, by far the most elegant one at that time, marked the "openness of the city to a new sector of important income". (De Rivero, 1940). Harth-Terre and Alvarez Calderón also designed it in neocolonial style, as an "attempt for recovering the elements, scale and concepts of the traditional Arequipan architecture with modern materials". (Maldonado, personal communication, 2005). It was the main factor that promoted the development of the urbanization (**Fig. 5.50**).



**Fig. 5.50.** Hotel de Turistas in 1940 (left) and 1960 (right). Source: Pardo





**Fig. 5.51.** View of Selva Alegre Park and Tourists hotel in 1950

**c) Observation promenade**

It was built in the west side, taking advantage of its location over a 50-meters cliff overlooking the river. Broad views of the basin and volcanoes can be enjoyed from its site (Zeballos, 1979) (Fig. 3.section 1). It was complemented with wooden piers and neoclassic balusters.

**d) Residential sector**

It followed a radial pattern in whose center was the hotel, surrounding the park towards the northeast. The road layout was a double circuit, one next to the park and the other one in between the blocks. The houses were placed in the middle of gardens, as in an American suburb. The neighborhood sidewalks were also planted with trees, covering an area of 1 ha, showing concern for the environment. The residential area occupied the 22.3% of the total area, but the constructed area was only the 5.8% of the whole urbanization.

**(3) Synopsis**

The urban developments of Vallecito and Selva Alegre started the process of expansion of the city, utilizing urban patterns that differed from the traditional ones used in the city. Both neighbourhoods were located next to the riverfront symbolized in order to emphasize the ideals of closeness to nature and the creation of a city resembling a garden.

## 5.6 THE FIRST MASTER PLAN IN AREQUIPA

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The new urban typologies established in Arequipa in the first decades of the 20<sup>th</sup> century influenced the development of the first urban plan in the city by the De Rivero in 1940.

Alberto de Rivero was one of the most conspicuous ideologists and planners at that time. He proposed ideas about urban environmental planning and landscape issues from 1916, when he published “El Ensanche Urbano de Arequipa” (The Urban Expansion of Arequipa). In 1935 he published the “Guía Monográfica e Histórica” (Historical Monographic Guide of Arequipa) and in 1940 he finished his “Nuevo Plano de la Ciudad y alrededores” (City and suburbs plan), for the 4<sup>th</sup> centennial of the foundation of the city. (**Fig. 5.52, Appendix 6**) The plan proposed a regulated expansion of the city, in which De Rivero emphasized the relationship of Arequipa with the river.

In his plan, De Rivero was comprised of the following projects<sup>19</sup>:

1. Construction of promenades along the riverbanks and the San Lazaro seasonal torrent because “aside of beautifying and give hygiene to those places, they can be used as picturesque road where much of the central traffic will be derived”.
2. Widening and extension of the transverse streets from east-west to connect them to longitudinal avenues north-south and with the river promenades.
3. Development of new urban zones with wide streets and avenues to built educational facilities, neighborhoods for workers and residential houses
4. Construction of public spaces or green areas, conveniently distributed in plazas, parks and woods.
5. Extension of the Bolognesi Boulevard until the Iron Bridge (3 km)
6. Transformation of the town of Yanahuara by widening its tortuous alleys and by tracing broad avenues and parks.
7. Connection of the two riverbanks divide by the Chili River by the construction of two new bridges: one of them will unify the extension of the Juan Manuel Polar square in Vallecito with the prolongation of the Bolognesi Boulevard and the other one will unify the Bolognesi Boulevard with Selva Alegre.

In the De Rivero’s proposal there was a clear emphasis on environmental issues, combining solutions to improve the vital conditions and, at the same time, the landscape characteristics.

The ideas on hygiene are combined with landscape premises and with functional needs. The vision of a unitary city where the river was not a limit but the center of the system is clearly evidenced by the use of longitudinal promenades and transversal bridges, connected to avenues that structured the city.

In the plan, it is also very clear the creation of a transversal green axis, perpendicular to the river, which would have been the continuation of Vallecito as well as the preservation of the riverfront areas as a metropolitan park

The Master Plan, prepared by the topographer Alberto De Rivero and the civil engineer Manuel E. De Rivero, was approved and partially executed by the mayor Julio E. Portugal. Some of the proposals were never built or others were unfortunately destroyed, but many other proposals, such as the development of Selva Alegre and the bridge near Vallecito, succeed. In either case, De Rivero played an important role conceiving and putting into plans the collective ideas and previous experiences, into the first attempt for urban environmental planning in Arequipa.



Fig. 5.52. 1940 Master plan by De Rivero

**(1) Understanding urban catalysis**

We understand *urban catalysis* as the “positive impact an individual urban building or project can have on subsequent projects and, ultimately, the form of a city” (Attoe & Logan, 1989, xi)<sup>20</sup>. An urban element that is shaped by the city and then, in turn, shapes its context could be defined as catalyst. Its function could therefore be described as a catalyst. Its function could therefore be described as a continual “regeneration of urban fabric” (Attoe and Logan, op cit)

The concepts of action-reaction or cause-effect are integral to catalytic theory, encouraging the interaction of new and existing elements and the impact on the urban form. Catalysis involves the introduction of one element that modifies others. Catalysts are existing urban elements of value that are “enhanced or transformed in positive way”. The new need not obliterate or devalue the old but can redeem it. The catalytic reaction is contained; it does not damage its context. (Fig. 5.53)

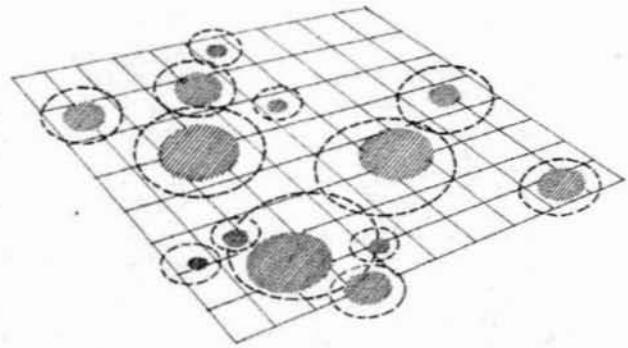


Fig. 5.53. The urban catalysis model according to Attoe and Logan (1989)

**(2) The process of urban catalysis in Arequipa**

In the case of Arequipa, the catalytic process not only implied the upturn of several spaces scattered throughout a network of roads. The success of the approach of the city to its riverscape lays on the development of a new “imageability”, a new way of understanding the environmental information, which incorporated the landscape in the perception of the population (Passini, op cit, 109). As it was previously mentioned, Arequipa was very segregated during colonial times. There were differentiated districts for the conquerors and the conquered, segregated not only by their spatial location but their urban layout (Gutierrez, op cit, 24). The river was considered a strong edge both for its topographical configuration and the cultural detachment from the population (Nicoli, 2006)<sup>21</sup>. The Main Square was the only public node and the campaniles of the churches were the most remarkable landmarks, not only because of their prominent form, but for the strong religiosity of the population (MPA, op cit, 12).

The spatio-temporal evolution of the catalytic process involving the spaces analyzed is shown in the Table 5.1.



**Table 5.1.** Spatio-temporal evolution of the catalytic process.

PLACE	1868	1890	1900	1910	1930	1940
1.Main Square	market	park				
2.San Francisco Sq.	market		park			
3.San Lazaro Sq.	market		park			
4.San Lazaro Bld	-	market	boulevard			
5 Grau Bridge		bridge				
6.Grau Park	-	-	-	playground		
7.Alameda Promenade	promenade	market	promenade			
8.Bolognesi Blvd	-	-	-	promenade		
9 River promenades				promenade		
10. Tingo	rural town	area for swimming		waterfront town		
11 Vallecito					Urban development	
12. Selva Alegre						Urban develop.

Two main stages can be distinguished in the catalytic process in Arequipa (**Fig. 5.52**):

**a) The catalysis around the Main Square**

The physical, spatial and functional evolution of the Main Square as a landscaped space for contemplation had direct influence in the transformation of other near-by open spaces. Hence, by the end of the 19<sup>th</sup> century, the first system of public spaces linked the Main Square with the San Francisco Square to the North (remodeled as a park in 1898) and the Alameda Promenade, to the East, located on the other side of the river. Both spaces were located less than 10 min. walking distance from the Main Square.

Despite the change of the role of the Main Square as a park, this space continued to be the most important area in the city. However, the strategic introduction of catalytic elements revitalized other areas without transforming them dramatically, improving the . a sense of whereness or “public inhabitability” (Moore & Bloomer, 1977, 84)<sup>22</sup>.

**b) The catalysis around the Chili River**

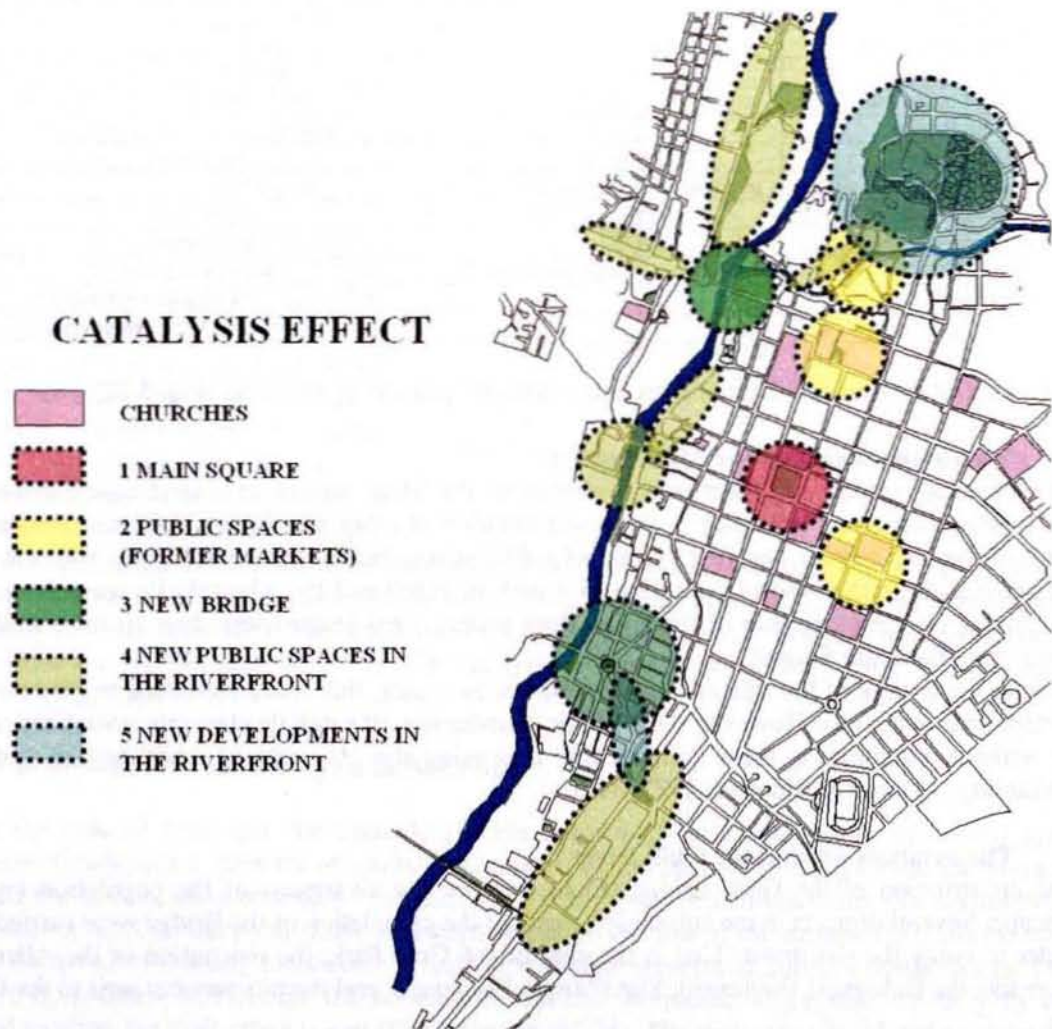
The construction of the Grau Bridge led to increase the awareness of the population on the riverscape. Several projects in the subsequent years of the completion of the Bridge were carried out in order to enjoy the riverfront. That is the case of the Grau Park, the renovation of the Alameda promenade, the Bolognesi Boulevard, The Ejercito Boulevard, and the promenades next to the Chili River.

That is also the case of Tingo, transformed from a rural settlement into a waterfront town, due to its microclimate benefits, the presence of numerous springs and the location of a train station in Tingo, the connection to the tram line

By 1920 many other public spaces had been linked forming the first landscape circuits, using the concept of spatial sequence. The Main Square was integrated to the river (circuit Main Square - San Francisco Square – Grau Park – Grau Bridge – Bolognesi Park) and to the Sain Lazaro stream (circuit Main Square – San Francisco Square – San Lazaro Square – San Lazaro Boulevard). The influence of the Main Plaza can be also observed in stylistic elements, such as common landscape design patterns and pavements, use of urban furniture and use of human scale.

The creation of new developments in the south, such as Vallecito and north, such as Selva Alegre, allowed the introduction of new urban patterns that allowed a visual and/or physical approach of the citizen to the riverscape. Moreover, the developments in front of the Bolognesi Boulevard, the Parra Avenue, Vallecito and Selva Alegre became the favorite places to accommodate the aristocracy and

medium-high class inhabitants (Lopez, 2006, personal comm.). At the same time, the new parks in the riverfront became the most popular places visited by the population (Pardo, op cit, 145-146).



**Fig. 5.54.** The urban catalysis in Arequipa.

### c) The spatial connection

Since the process of catalysis did not involve the destruction of large areas in order to replace them with monumental connectors, the link between spaces was carried out with more subtle urban elements. (**Fig. 5.55**)

The public space was perceived by the visualization of its limits and by kinesthetic experience, i.e., by the sensation of movements (Zucker, 1959, 6)<sup>23</sup>. These components stimulated the movement from one place to another along the paths, facilitating the orientation, the act of reaching a goal as well as a connection between “here” and “there”.

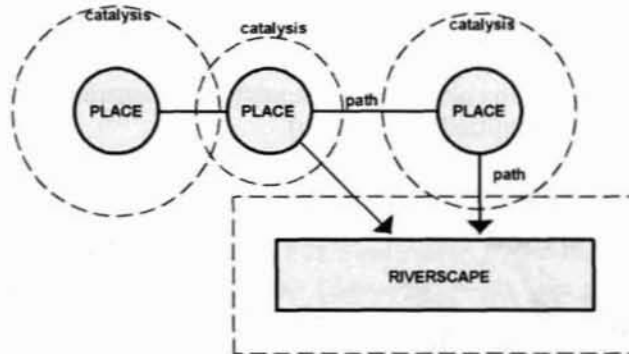


Fig. 5.55. Proposed urban model of the process of urban catalysis in Arequipa.

Those visual connectors used in the system were basically the following:

- Architectural landmarks:** which in this case were basically the campaniles of the churches, very distinguishable among the flat Arequipan townscape. In a closer distance, the facade of the monument can be identified. Examples, the Cathedral in the Main Square and the Churches of San Francisco and San Lazaro in their respective plazas.
- Frames:** they behave as an invitation to walk through, a virtual gate to an important place. The arched arcades of the Main Square, projected and aligned with the axis of the street, are the main reference to the plaza, from the paths where the towers of the Cathedral can not be seen.
- Topography:** orientation from the slope and configuration of the ground.
- Enclosure/exposure:** The contrast between the sensation of enclosure after strolling along narrow streets that lead to an open area can produce emotions like mystery and surprise. In Arequipa, the narrow sloped streets lead to the impressive riverscape, where the ravine of the river and the snowed volcanoes in the distance offer impressive panoramas.
- Vegetation:** it is particularly important in the case of a dry townscape, as Arequipa and many other Spanish influenced cities were designed. The rhythmical succession of trees, motivates motion. Their arrangement in groups suggests a destination.

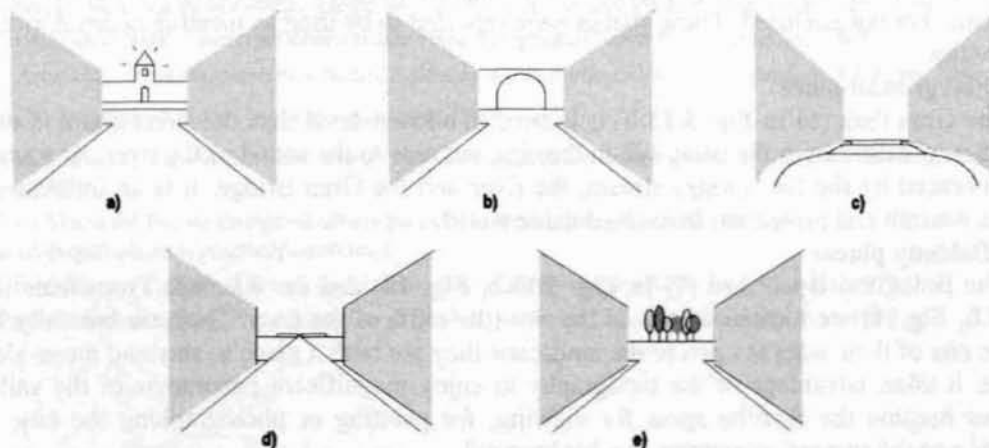


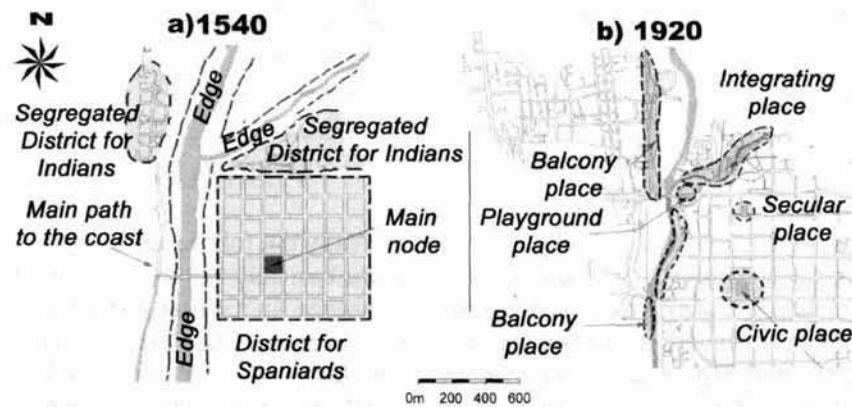
Fig. 5.56. Elements that promote attractiveness among the public spaces

a) Architectural landmarks. b) Frames. c) Topography. d) Enclosure/exposure e) Vegetation.

## 5.8 SUMMARY

In contrast with the only node in colonial times, a multi-nodal spatial system was created, where five types of places have been identified (Fig. 5.57.b).

### a) Civic Monumental Scaled place:



**Fig. 5.57.** Evolution of the urban spaces in Arequipa

- a) From 1540 to 1800 Arequipa was a very segregated city
- b) Recreational places promoted a new perception of the city and a strong relation between modernity and closeness to nature.

The Main Square (1) in Fig. 5.13.b) traditionally concentrates the main public functions: social, cultural, civic, religious and political. It is centralized, hierarchical; its shape is regular and its scale is monumental. It is considered as the most important civic place in the city.

### b) Secular Human Scaled place:

The San Francisco Square (3) in Fig. 5.13.b, Fig 13), and the San Lazaro Square (4) in Fig. 5.13.b) were originally spaces surrendered by the churches for evangelization purposes and they became later the areas for public use. Their shape is irregular and their scale is more human and intimate, but not enclosed. These spaces were reported to be used as meeting nodes during religious festivities.

### c) Playground place:

The Grau Park (6) in Fig. 5.13.b) is located in a lower level than the street and it is detached as much as possible from the noisy life in the city, but near to the sound of the river. Its rounded shape is embraced by the San Lazaro stream, the river and the Grau Bridge. It is an intimate space and gives warmth and protection from the outside world.

### d) Balcony place:

The Bolognesi Boulevard (7) in Fig. 5.13.b, Fig. 10) and the Alameda Promenade (2) in Fig. 5.13.b, Fig.14) are located on top of the rim (the cliff) of the river. They are basically linear but, since one of their sides is open to the landscape they are both a place to stay and move along. From there, it takes advantage of the topography to enjoy magnificent panoramas of the valley. Those places became the favorite spots for viewing, for painting or photographing the city, the green valley and the snowed mountains as a background.



**e) Integrating place:**

The San Lazaro Blvd (**5**) in Fig. 5.13.b) is located at the edge of a stream, it is used to unify two areas which were traditionally divided, the Spanish origin gridiron layout with the organic Indian neighborhood, creating a promenade along San Lazaro stream.

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## **CHAPTER 6**

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### **CONCLUSIONS**

## RESULTS FROM THE PREVIOUS CHAPTERS

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The case of study has been analyzed from three aspects: the relation with its physical environment, its streetscape and its open public spaces.

In Chapter 2, the characteristics of Arequipa's physical environment were identified, such as the topography, the seismic conditions and the weather. These elements influenced the urban-architectural patterns applied in the city. The environment also defined an impressive landscape, a combination of natural features with the transformation of the terrain with agricultural terraces and irrigations. Finally, the spatial characteristics of the river basin and their relation with the urban fabric were explained in 6 different sectors.

Chapter 3 aims to clarify the uniqueness of Arequipa's urban structure from the perspective of the evolution, and arrangement of its street types, as well as their relation with the landscape. Five types of street were identified: Pre Hispanic, Hispanic, Republican, Tree-Lined and Riverfront promenade. Each type was analyzed along with its historical background and its physical characteristics, particularly the ones from 1870 to 1940. The urban structure of the city was based on the co-existence of these street types.

In Chapter 4, the main characteristics of the evolution of Arequipa's Main Square are discussed, as well as its surrounding buildings from its origin in colonial times to their conditions prior to the 1868 earthquake. Subsequently it was focus on the transformation of the plaza from 1868 to 1920. Later, the main characteristics acquired in the Main Square explain, and its role as a space for the innovation of urban landscape design ideas. The consolidation of its spatial structural coherence, the enhancement of its monumentality and scale and the inclusion of new recreational activities in addition to its previous socio-cultural-civic role.

Chapter 5 analyzed the relation of the public spaces and the riverfront, using GIS tools. A qualitative increase of the green areas with respect to the urban areas was found in the period from 1870 to 1940. Subsequently, the characteristics and evolution of the most important public spaces attached to the river were explained and they were classified according to their spatial characteristics. Finally, a process of urban catalysis was proposed, establishing the nature of the relations among spaces and the influence that the Main Square and the Chili River had in the landscape planning of the city.

## CONCLUSIONS

### (1) AREQUIPA AND ITS NEW ROLE

During the period of 1870 to 1940 Arequipa changed dramatically from a town based on a rural economy, isolated from the country and the world and under the ideological and institutional hegemony of the Catholic Church. During this period Arequipa consolidated a leading role in the economic development of the southern part of Peru, and as an efficient urban center that channeled the trade between the highlands and the coast and overseas.

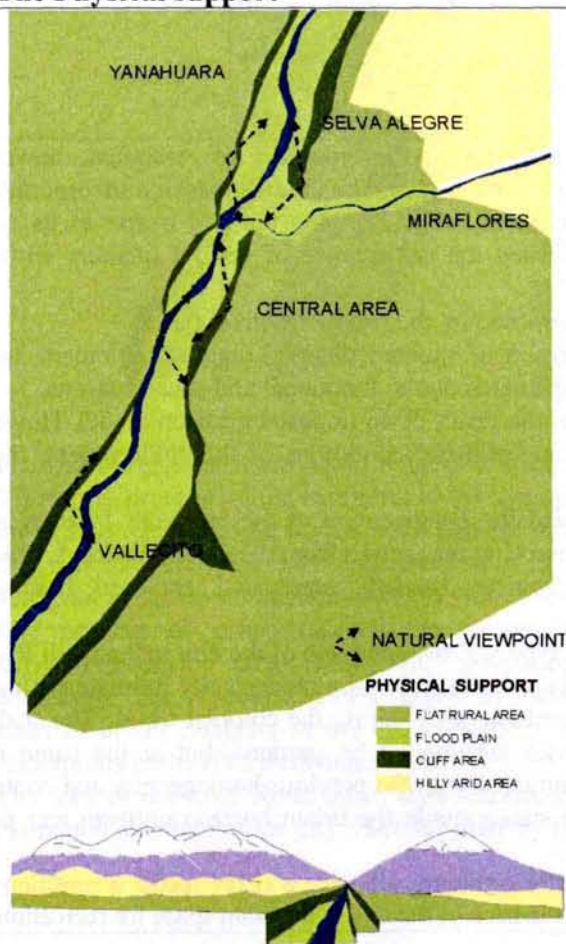
The 1868 earthquake became a breakpoint in the development of the city, triggering the expansion of the city but considering new ideals of closeness to nature and, at the same time, respecting the urban-architectural heritage. Also, new materials and techniques were used in order to produce anti seismic structures.

The construction of the railroad in 1871 put an end to the economic and physical isolation, shifting the economy from rural to a predominantly commercial activity. It also favoured the importation of goods and eased the immigration of foreigners, who brought new ideas and became a new aristocracy, based on commerce and trade.

In this period the basis of contemporary Arequipa were defined.

### (2) THE PHYSICAL-SPATIAL MODEL

#### a) The Physical support



The natural environment has strongly conditioned the characteristics of the landscape, the urban development of Arequipa and the particular character of its architecture.

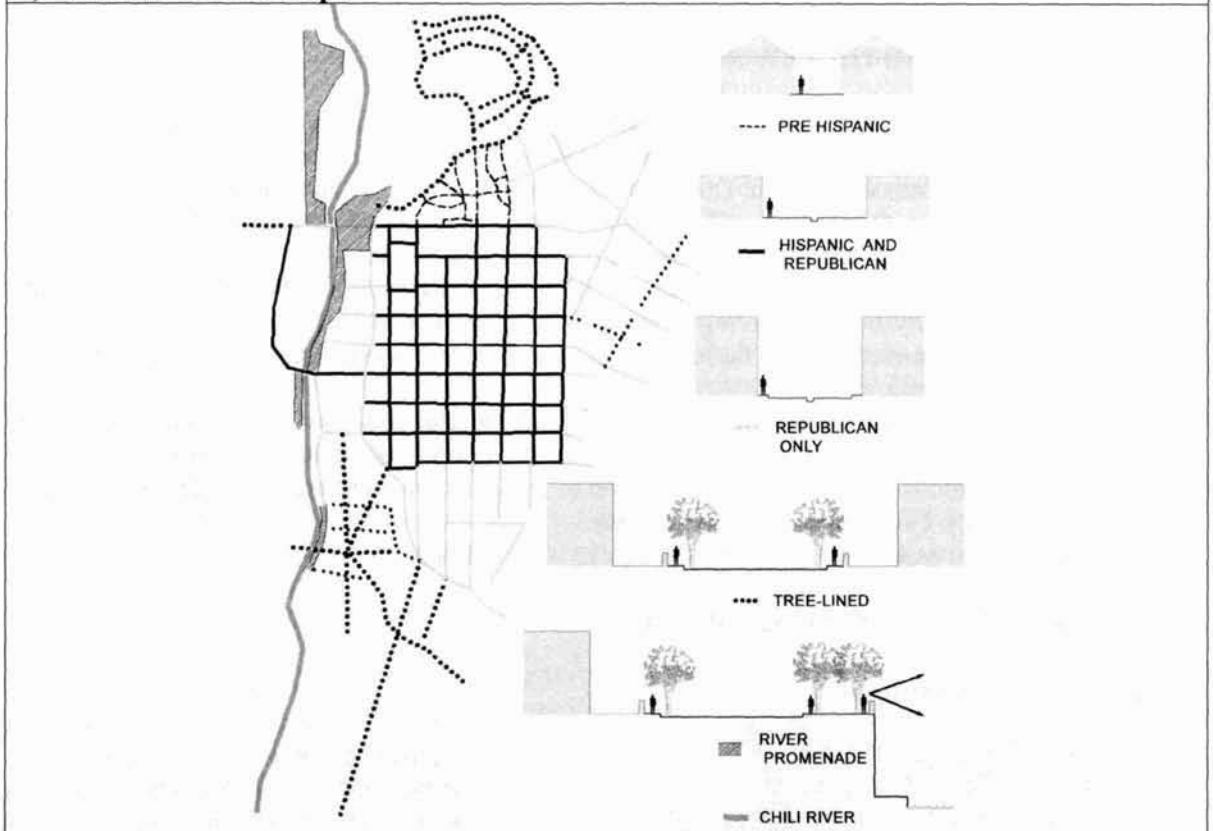
The topography and geomorphology were factors that conditioned the foundation and expansion of the urban layout of the city. The hilly topography and the scarcity of water for agriculture, determined a very rational use of this resource by the construction of agricultural terraces that modeled the landscape.

The periodic occurrence of strong earthquakes motivated the improvement of the anti-seismic construction techniques and the use of more resistant materials, such as the white stone rock called *sillar* instead of the adobe. Nevertheless, the city had to be reconstructed several times due to these seismic activities.

The origin of the valley was the Chili River. The river affords different characteristics according to the configuration of the terrain and its contact with the urban fabric. It also offers a varied riverscape within a short way, becoming a very important landscape resource and natural heritage for the city. The Chili Valley has natural conditions as a viewpoint of the landscape.



## b) The urban streetscape

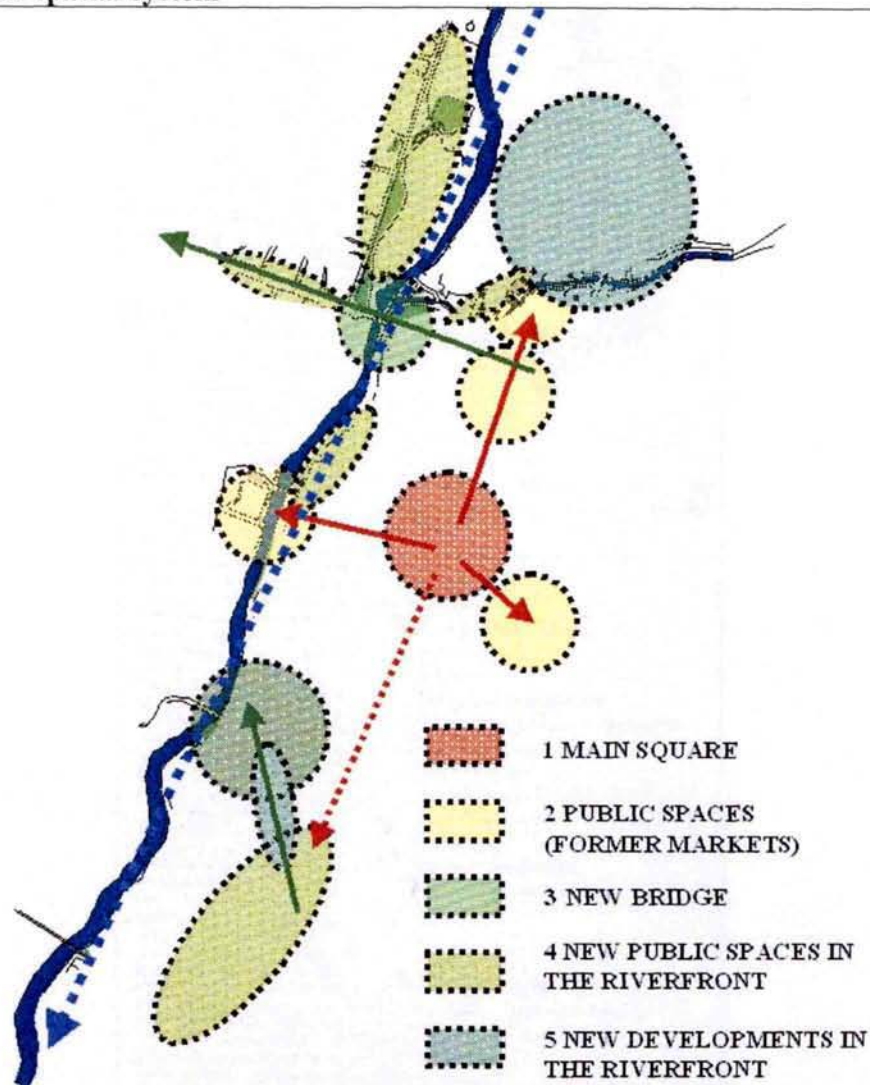


The 1868 earthquake was a breakpoint in the urban development of Arequipa, however, the reconstruction respected the city's heritage and urban layout. The urban expansion incorporated a new streetscape, undergoing a process of modernization while bringing the city nearer to its landscape resources. From 1868 to 1940 Arequipa afforded the coexistence of several quarters with various street types.

The unique streetscape of Arequipa was composed by the following street types:

- 1) The original Pre-Hispanic Type was the result of spontaneous and organic settlement, integrated into the landscape, but later secluded by the Spaniards due to functional and social reasons.
- 2) The Hispanic Type, on the other hand, was the result of an imposed gridiron model. However, the streetscape was conditioned by the seismic and climatic conditions of the environment, the use of local materials and labor force.
- 3) Similarly, the Republican Type consolidated the compactness of the Hispanic Type by adding a second story to the colonial buildings, but conserving the pattern from the colonial period. These street types expressed the characteristics of their society: spatially segregated, enclosed, homogeneous, compact and introverted.
- 4) The development of new landscaped street type and the approach of the city to the Chili River from 1870 to 1940 was an expression of the society's desire to build a modern city intimate with nature, a remarkable ideological change after the cultural isolation during the colonial times. The scale of the street space was enhanced by the new houses surrounded by gardens, but at the same time the individuality of the freestanding buildings contrasted with the previous homogeneity and continuity of the urban skyline. However, the trees in the streets made the urban horizon uniform and promoted social exchange among the passers-by.
- 5) The Riverfront promenade Type was a space for gathering, allowing a visual spatial connection with the riverscape and transforming the riverfront from the back of the city to the main space for recreation.

### c) The urban spatial system



The transformation of the Main Square in Arequipa from a plaza-market to a plaza-park (1868 – 1920) is an expression of the evolution of the local population's approach to nature and landscape. The Main Square was the space for the innovation of urban landscape design ideas, the consolidation of its spatial structural coherence, the enhancement of its monumentality and scale and the inclusion of new recreational activities in addition to its previous socio-cultural-civic role.

The process of urban catalysis revitalized surrounding areas without involving dramatic modifications of the urban fabric and generating an urban spatial system enhanced by visual relationships. The process had two stages: a) the strategic remodeling of the Main Square led to a process of urban catalysis in the nearby public spaces. b) The creation of new spaces and urban developments in the riverfront area.

The idea of the Chili River as an urban-landscape backbone in the development of the city was a fundamental idea in the first city's Master Plan By the Rivero in 1940.



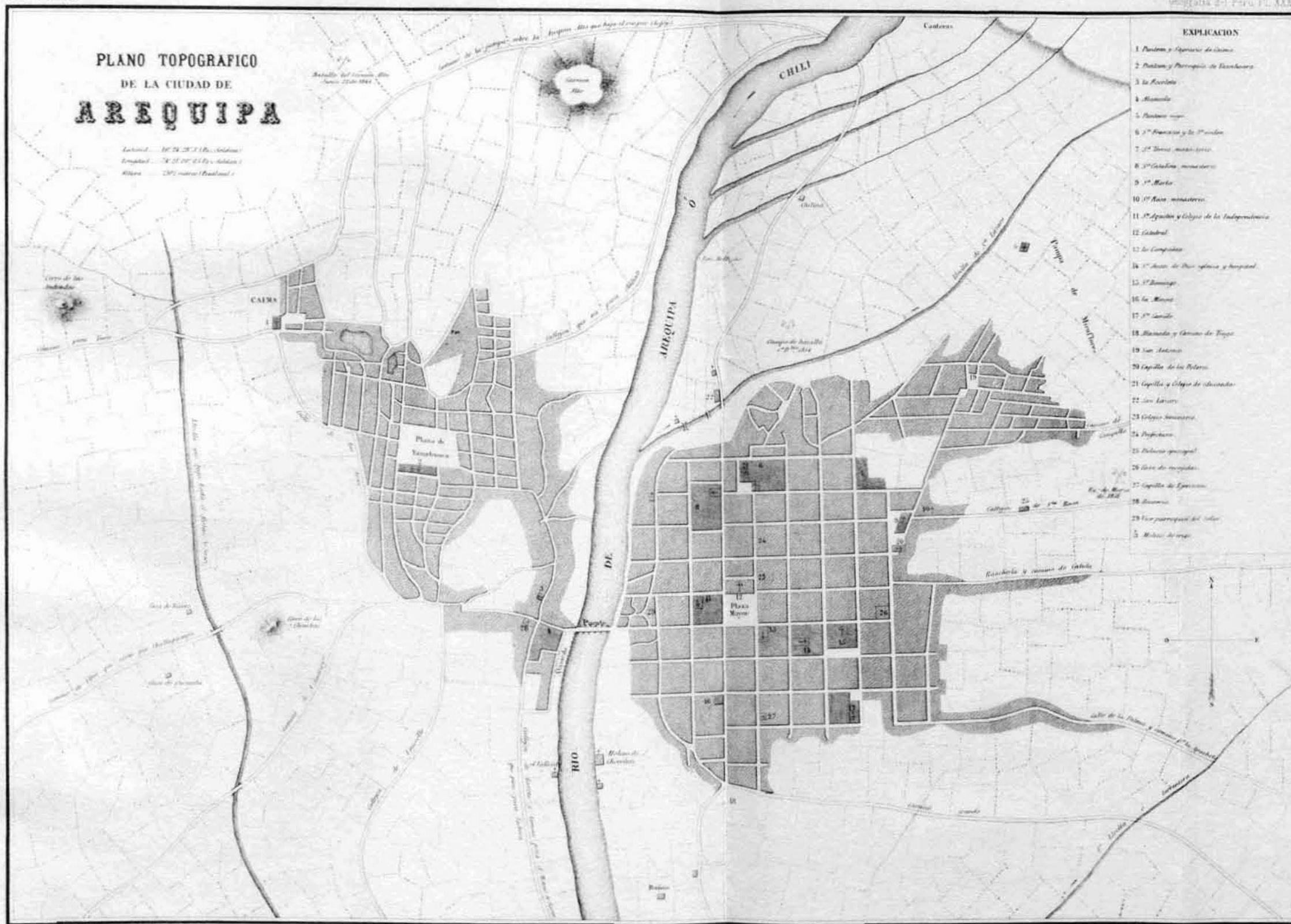






**Appendix 2:** 1835 map by Diego Rodriguez dedicated to Jose Sebastian de Goyeneche y Barreda.  
 Landscape features are shown in detail

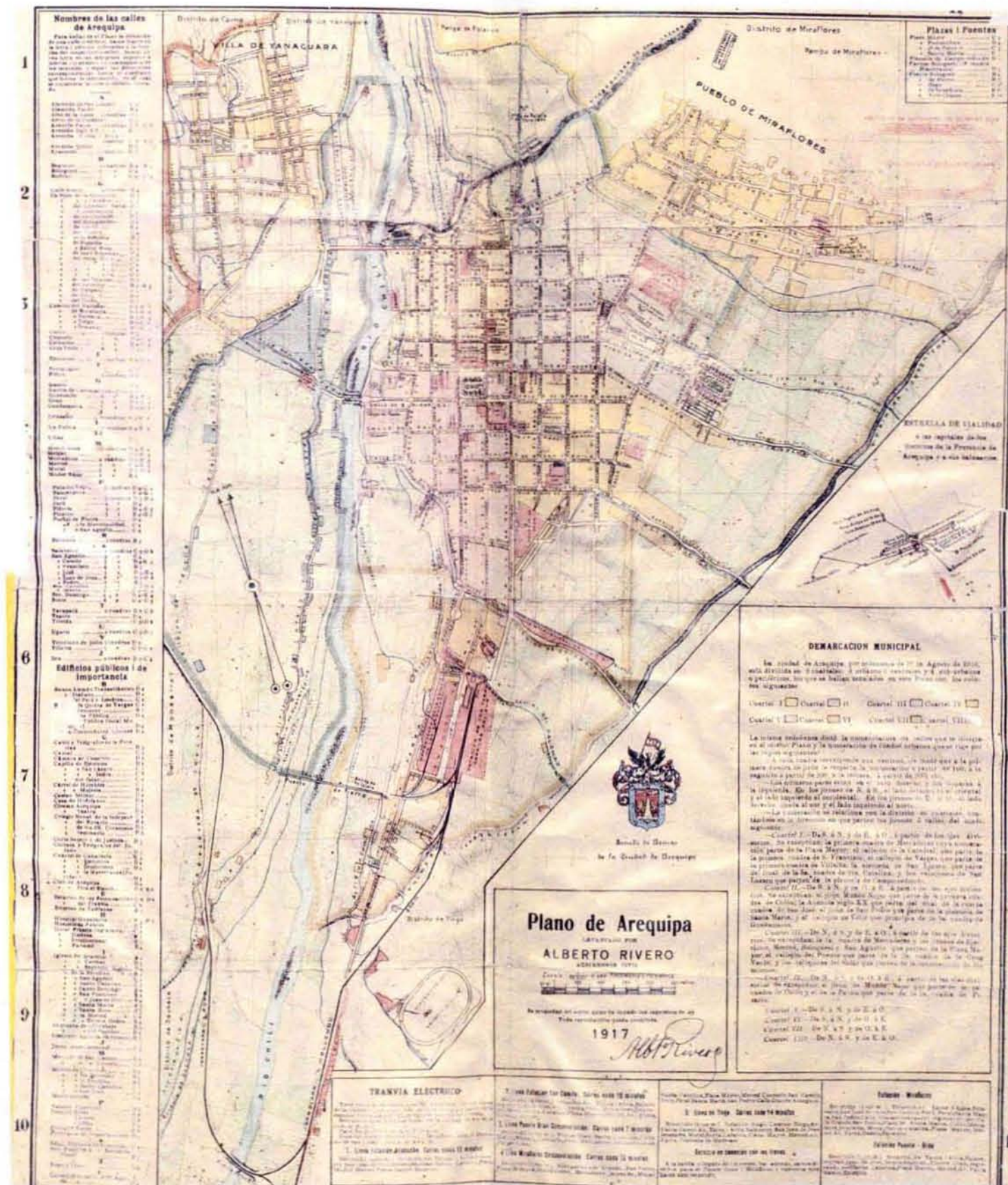




Appendix 3: 1865 topographic map published in Paris by Mariano Felipe Paz Soldán  
Lists monuments and depicts farm plots.

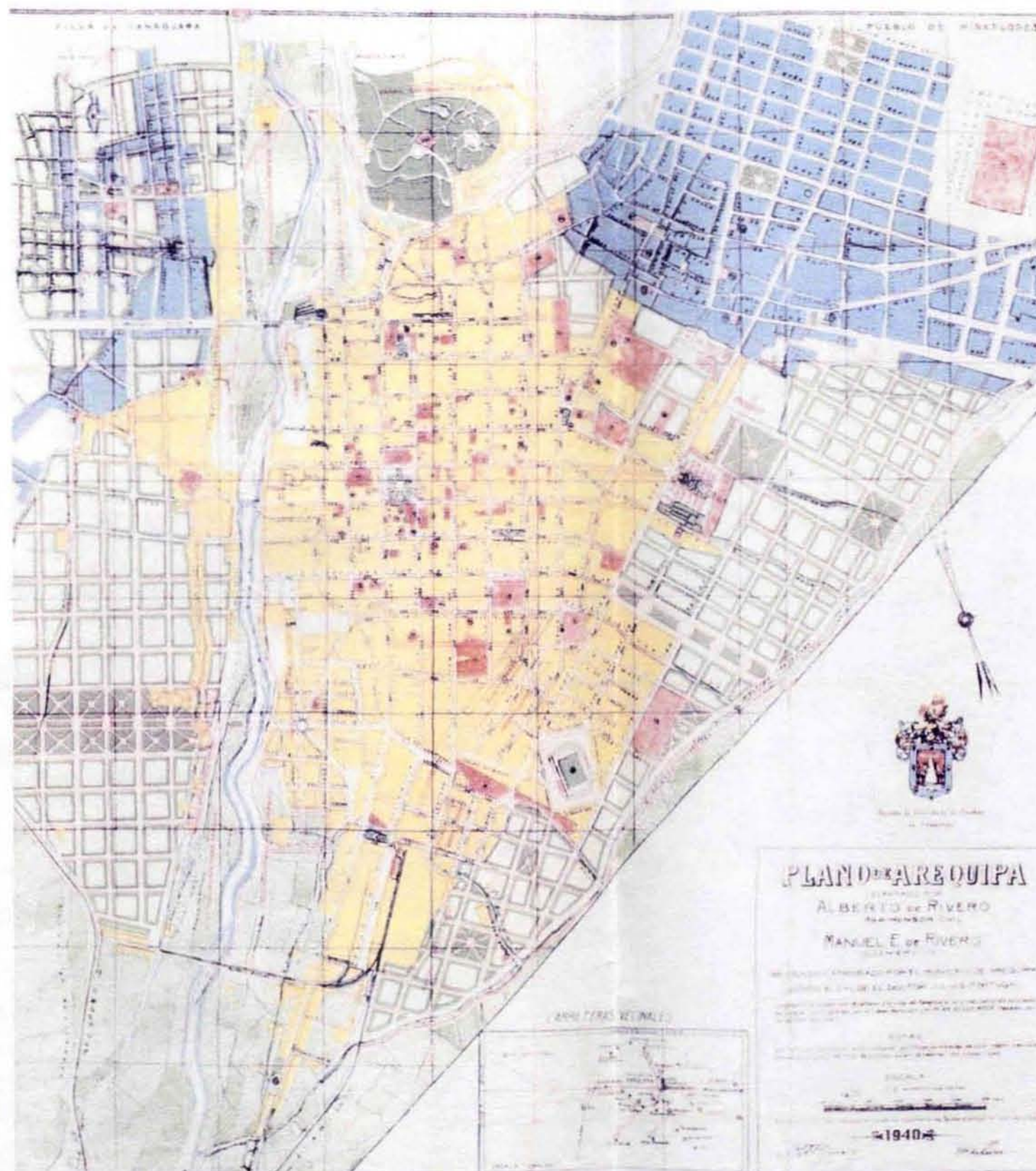






Appendix 5: 1917 map by Alberto de Rivero.  
 Made with accuracy, depicts expansion to the train station





**Appendix 6:** 1940 map by Alberto de Rivero.  
The first master plan of Arequipa.